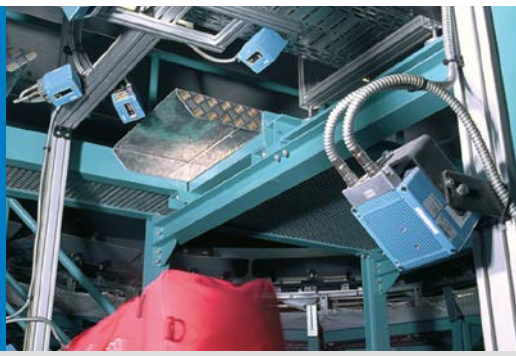
OPERATING INSTRUCTIONS

Modular system controller MSC800



EN

SICK
Sensor Intelligence.

SICK AG, Waldkirch

Identification & Measuring, Reute plant

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Issue version of the operating instructions

The latest version of these operating instructions is available as a PDF at **www.sick.com**.

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1 About these operating instructions

Please read this chapter carefully before you begin working with this documentation and the MSC800 measuring system.

1.1 Described software version

Software/Tool	Function	Status
MSC800	SICK firmware	From V 1.0 0000
Description of MSC800 device	Device-specific software module for SOPAS-ET configuration software	From V 1.00
SOPAS ET	Configuration software	From V 2.12

1.2 Purpose of this document

This document guides technically qualified and authorized personnel through the installation and operation of the following variants of the MSC800 modular system controller:

- MSC800-0000: logic unit
- MSC800-1100: logic unit with power supply unit (10 A) in a cabinet
- MSC800-2100: logic unit with power supply unit 10 A) in a cabinet
- MSC800-2300: logic unit with power supply unit (30 A) in a cabinet
- MSC800-3400: power supply unit (40 A) in a cabinet
- MSC800-3600: power supply unit (60 A) in a cabinet

Depending on the number of connected ID sensors, an MSC800-1100/-2100 or an MSC800-2300 is used. In order to increase the total performance of the power supply units, the MSC800-2300 can be combined with another MSC800-3400 or MSC800-3600.

The document contains information on

- Mounting and electrical installation
- Commissioning
- Operation and configuration
- Maintenance
- Troubleshooting
- Replacing system components

Instructions are given in stages for all actions.

For simplicity in this document, the MSC800 modular system controller will be referred to as “MSC800”, unless a clear distinction needs to be made between variants.

The 1D / 2D code sensors, e.g., the ICR880/890 camera system or the CLV490 bar code scanner, will be referred to as ID sensors.

1.3 Target group

The target group for this document consists of people in the following roles:

Activities	Target group
Mounting, electrical installation, maintenance, and replacement of system components	Qualified personnel, such as service technicians or industrial electricians
Commissioning and configuration	Qualified personnel, such as technicians or engineers
Operation of the conveying system	Personnel qualified in running and operating the conveying system

Tab. 1 Target group

1.4 Information depth

Note This document contains all information for the mounting, electrical installation, and commissioning of the MSC800 on-site.

The configuration of the MSC800 for the application-specific reading situation and operation for this purpose are carried out via the SOPAS-ET configuration software on a Windows™ PC. In the SOPAS-ET configuration software, there is an online help system available to support the configuration.

Further information on high-end CCD camera systems, volume measurement systems, and bar code scanners is available from SICK AG, Identification & Measuring. Online at **www.sick.com**.

1.5 Abbreviations used

BMP Bitmap (pixel-oriented Windows format for saving photos)

CAN Controller area network (fieldbus log based on the CAN bus)

CCD Charge coupled device

CLV Code reader V-principle

DOF Depth of field

EEPROM Electrically erasable programmable read-only memory (electrically erasable and programmable nonvolatile memory)

FTP File transfer protocol

HTML Hypertext markup language (page description language used on the Internet)

I Input

ICD Image capture device (camera)

ICI Image capture illumination

ICR Image code reader (high-end CCD camera system)

ID Identification

JPEG Joint photographic expert group (pixel-oriented file format for saving photos with high compression, compression procedure for Tiff formats)

LED Light emitting diode

MAC	Medium access control
MLG	Modular light grid
MSC	Modular system controller (MSC800)
MTBF	Mean time between failure
MTTR	Mean time to repair
O	Output
PROM	Programmable read-only memory (electrically programmable non-volatile memory)
RAM	Random access memory (direct-access volatile memory)
RCD	Residual current protective device (FI circuit protection)
ROM	Read-only memory (read-only, nonvolatile memory)
SD	Secure digital card (digital, replaceable memory card)
SMART SICK	Modular advanced recognition technology
SOPAS ET	SICK Open Portal for Application and Systems Engineering Tool (PC software for Windows for configuration of the ICR890 system and the MSC800)
PLC	Programmable logic controller
TCP/IP	Transmission control protocol/Internet protocol
UDP	User datagram protocol
VMS	Volume measurement system

Important

The MSC800 modular system controller, the components of the ICR890 system, and other components are referred to in the following simplified form in this document:

- **M**odular **s**ystem **c**ontroller MSC800, simplified: MSC800
- High-end CCD camera system, simplified: ICR890 system
- **I**mage **c**apture **d**evice ICD890, simplified: ICD890 camera
- **I**mage **c**apture **i**llumination ICI890, simplified: ICI890 illumination
- CLV490 bar code scanner, simplified: CLV490
- MLG **m**odular **l**ight **g**rid, simplified: MLG light grid
- VMS4xx/5xx **v**olume **m**easurement **s**ystem, simplified: VMS4xx/5xx
- **S**ICK **O**pen **P**ortal for **A**pplication and **S**ystems **E**ngineering **T**ool, simplified: SOPAS-ET configuration software.

The ICR890 systems and the CLV490 bar code scanner are referred to together as ID sensors.

The tabs for the configuration of the MSC800 are referred to as “device pages” in the online help of the SOPAS-ET configuration software.

In addition, there is the option to connect further SICK sensors which are not explicitly mentioned in these operating instructions. For additional information, please contact your local SICK sales and marketing company.

1.6 Symbols used

In order to make it easier to access information quickly, some information is highlighted as follows in this documentation:

NOTE

Note

A note refers to a potential risk of damage or loss of function of the MSC800 or the devices connected to it.

⚠ WARNING

Warning

A warning refers to specific or potential dangers to the physical safety of the user. It is there to protect the user against accidents.

The safety mark next to the warning, on the left, refers to the type of accident risk, e.g., electricity-related. The ascending warning levels (CAUTION, WARNING, DANGER) refer to the severity of the possible danger.

➢ Always read the warnings carefully and make sure you comply with them.

Important This important note is there to advise you on special aspects.

Explanation An explanation provides background information about technical contexts.

Recommendation A recommendation helps you to carry out an action in the best way possible.

TIP A tip explains setting options in the SOPAS-ET configuration software.

Project

This font is used to label a term in the SOPAS-ET configuration software user interface.

A symbol refers to a button in the SOPAS-ET configuration software user interface.

“0x0”

This font is used to indicate messages issued by the MSC800.

This symbol designates a section which describes operation steps with the SOPAS-ET configuration software.

This symbol refers to supplementary technical documentation.

➢ This indicates that action needs to be taken. This symbol indicates an instruction which only contains one step, or steps in warnings where you do not have to adhere to a certain order.

Multi-step instructions to action are indicated by consecutive numbers.

⇨ This symbol refers to an entry in the glossary.

2 On safety

This chapter concerns your own safety and the safety of the operators.

➢ Read the chapter carefully before using the MSC800.

2.1 Authorized personnel

In order to function safely, the MSC800 must only be mounted, operated, and maintained by adequately qualified personnel.

➢ The operating instructions must be made available to the end user.

➢ The end user must be instructed by qualified safety personnel and must read the operating instructions.

The following qualifications are necessary for the various tasks:

Activities	Target group
Mounting, maintenance	• Basic practical technical training • Knowledge of the current safety regulations in the workplace
Electrical installation and replacement of system components	• Practical electrical training • Knowledge of current electrical safety regulations • Knowledge of device control and operation in the particular application concerned (e.g., conveying line)
Commissioning, configuration	• Basic knowledge of the WindowsTM operating system used • Basic knowledge of the design and setup (addressing) of Ethernet connections when connecting the MSC800 to Ethernet • Basic knowledge of how to use an HTML browser (e.g., Internet Explorer™) to access the online help • Basic knowledge of data transmission • Basic knowledge of 1D / 2D code technology
Operation of the device for the specific application	• Knowledge of the mechanical and electrical parameters of the conveying line and properties of the conveying system that relate to control and operation

Tab. 2 Qualifications required for commissioning the MSC800

2.2 Intended use

The MSC800 modular system controller is used in combination with an appropriate number of ID sensors (for 1D / 2D codes) and a VMS4xx/5xx. The logic unit of the MSC800 carries out the coordination of the sensors.

The intended use of the MSC800 can be found in the following description of the system components and their function:

- The ID sensors are supplied with voltage via the power supply unit of the MSC800.
- In combination with the MSC800, the ID sensors transfer the data to the MSC800 via the CAN interface. The data is then available there at the HOST data interface.
- The configuration and operation of the MSC800 is carried out, as standard, via the AUX auxiliary data interface (serial RS-232 or Ethernet) with the SOPAS-ET configuration software, which runs on a standard PC provided by the customer.
- As an individual component, the MSC800-0000 logic unit is intended for installation in the device as a whole, which in turn is intended for resale or integration into a third party system. The assembly must be installed in a metal housing. See the installation regulations in chapter **4.3.2 Mounting individual components of the logic unit** on page 40.

In the event of any other usage or modification to the system, even during mounting and electrical installation, or to the SICK software, any claims against SICK AG under the warranty will be rendered void.

2.3 General safety notes and protective measures

Read the general safety notes thoroughly and pay careful attention to them when carrying out any work on the MSC800. Also observe the warnings before the instructions to action in the individual chapters of this document.

2.3.1 Standard IP technology

NOTE

Safe network environment

SICK uses standard IP technology in its products. The focus is on availability of products and services.

SICK always assumes the following prerequisites:

- The customer ensures the integrity and confidentiality of the data and rights affected by its own use of the aforementioned products.
- In all cases, the customer implements the appropriate security measures, such as network separation, firewalls, virus protection, and patch management.

2.3.2 Cyber security

NOTE

Cyber security contacts for SICK products

Current safety messages from SICK are published at *https://www.sick.com/psirt* by the SICK Product Security Incident Response Team (SICK PSIRT).

If you identify weak points or incidents regarding the cyber security of SICK products, you can contact the SICK PSIRT (*psirt@sick.de*).

More information can be found at the address above.

2.3.3 Radio interference

NOTE

Radio interference may occur when used in residential areas

The MSC800 must be used exclusively in industrial environments.

2.3.4 Mounting work

⚠ WARNING

Risk of injury due to falling components

The weight of the MSC800 can be approx. 10 to 20 kg depending on the variant.

- ➢ Do not do mounting work alone.
- ➢ Have a second person hold the components during mounting.

2.3.5 Electrical installation work

DANGER

Risk of injury due to electrical current

The MSC800 is connected to the mains voltage unit (AC 100 ... 264 V / 50 ... 60 Hz).

- Comply with standard safety requirements when working on electrical plants.

DANGER

Risk of injury due to electrical current

The socket in the MSC800, to which the mains voltage IN is also applied, is **not** equipped with a residual current protective device (RCD) from the factory.

- The socket can only be used by **qualified electricians for service purposes**, e.g., to connect a laptop. If necessary, insert a mobile plug-in FI circuit-breaker in the socket according to the safety concept provided by the customer.
- The socket is **not suitable** for connecting work equipment such as drilling equipment, cleaning equipment (e.g., vacuum), etc.
- If necessary, insert an external automated mains voltage isolator (e.g., residual current protective device) for the mains voltage IN of the MSC800 according to the safety concept provided by the customer.

2.3.6 Repairs

NOTE

Risk of damage to the MSC800

Repair work on the MSC800 may only be performed by qualified and authorized service personnel from SICK AG.

2.4 Quick stop and quick restart

The MSC800 can be switched on and off via a main switch provided by the customer.

2.4.1 Switching off MSC800

➢ Turn off the supply voltage to the MSC800.

When switching off the MSC800, at the most, the following data will be lost:

- User-specific parameter sets in the logic unit of the MSC800 and in the ID sensors, which are only temporarily saved in the devices
- Last reading result
- Daily operating hours counter.

2.4.2 Switching on MSC800

➢ Switch the supply voltage to the MSC800 back on again.

The MSC800 restarts operation with the last permanently saved configuration. The daily operating hours counter is reset.

2.5 Protecting the environment

During construction of the MSC800, attention was paid to achieving the lowest environmental impact possible.

2.5.1 Power consumption

The ID sensors are supplied with electrical energy via the power supply unit of the MSC800 (protective extra-low voltage DC 24 V as per IEC 364-4-41).

The system components have the following power consumption:

System components	Power consumption
MSC800-0000 (logic unit)*	Typical 10 W at DC 24 V ± 10%
ICR890 camera system	Typical 425 W at DC 24 V ± 10% (via power supply unit of the MSC800-2300, -3400 or -3600)
CLV490 bar code scanner	Typical 18 W at DC 24 V ± 10% (via power supply unit of the MSC800-1100, -2100, -2300, -3400 or MSC800-3600)
VMS410/510	Typical 25 W at DC 24 V ± 10% (via power supply unit of the MSC800-1100, -2100, -2300, -3400 or MSC800-3600)
VMS420/520	Typical 50 W at DC 24 V ± 10% (via power supply unit of the MSC800-1100, -2100, -2300, -3400 or MSC800-3600)
* The logic unit is contained in the MSC800-1100, MSC800-2100 or MSC800-2300	

Tab. 3 Power consumption of the MSC800 modular system controller

2.5.2 Disposal after final decommissioning

SICK AG does not currently take back devices that are unusable or irreparable.

- Unusable or irreparable devices are to be disposed of in an environmentally safe manner in accordance with the relevant national waste disposal regulations.

The construction of the MSC800 allows separation into recyclable secondary raw materials and special waste (electronic scrap).

See also chapter **7.6 Disposal** on page 87.

Important The battery in the logic unit of the MSC800 must be removed before scrapping the device.

- Dispose of the battery separately as per the RoHS directives (Europe).

3 Product description

This chapter provides information on the structure, properties, and function of the MSC800.

➢ To help with mounting, electrical installation, and commissioning, and for the configuration of the logic unit of the MSC800 with the SOPAS-ET configuration software, read the chapter before starting work.

3.1 Structure of the MSC800

The MSC800 consists of a logic unit and one or more power supply units in a cabinet (control cabinet). The MSC800 is used in combination with ID sensors and a VMS4xx/5xx (detection of object shape). In order to do this, the sensors are connected to the MSC800 logic unit via the CAN bus.

The MSC800 power supply unit (supplies) feeds (feed) DC 24 V supply voltage to the sensors. The MSC800 does not have a main switch for the incoming supply voltage AC 100 ... 264 V / 50 ... 60 Hz.

External sensors are required for the read cycle, for detecting the object distance (with MLG, alternative to the VMS4xx/5xx, application-dependent), and for generating an increment signal. These sensors and the superordinate host computer are also connected to the MSC800.

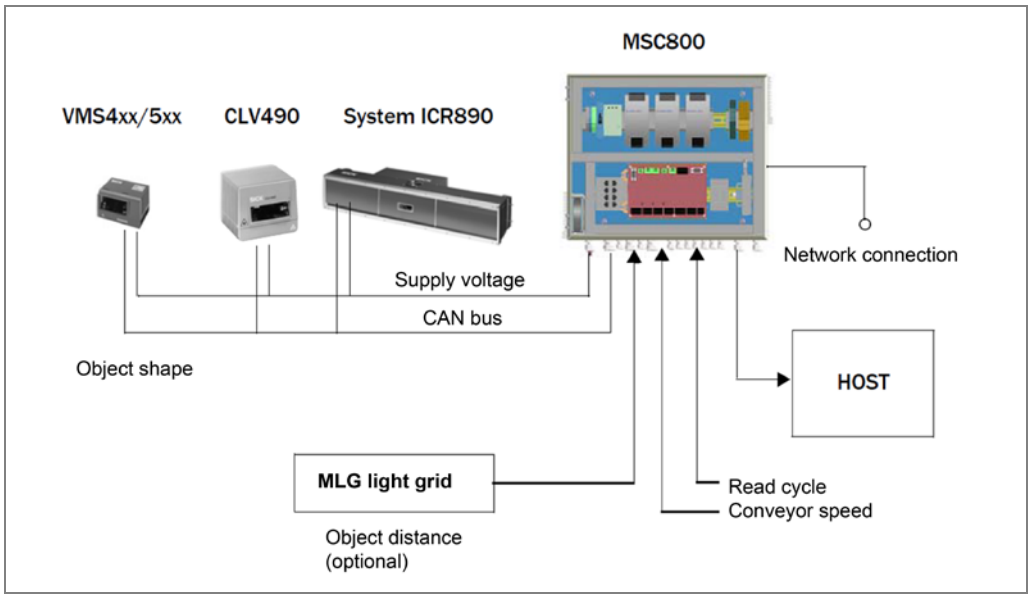


Fig. 1: MSC800 in combination with ID sensors and external sensors

3.1.1 MSC800-1100 device view

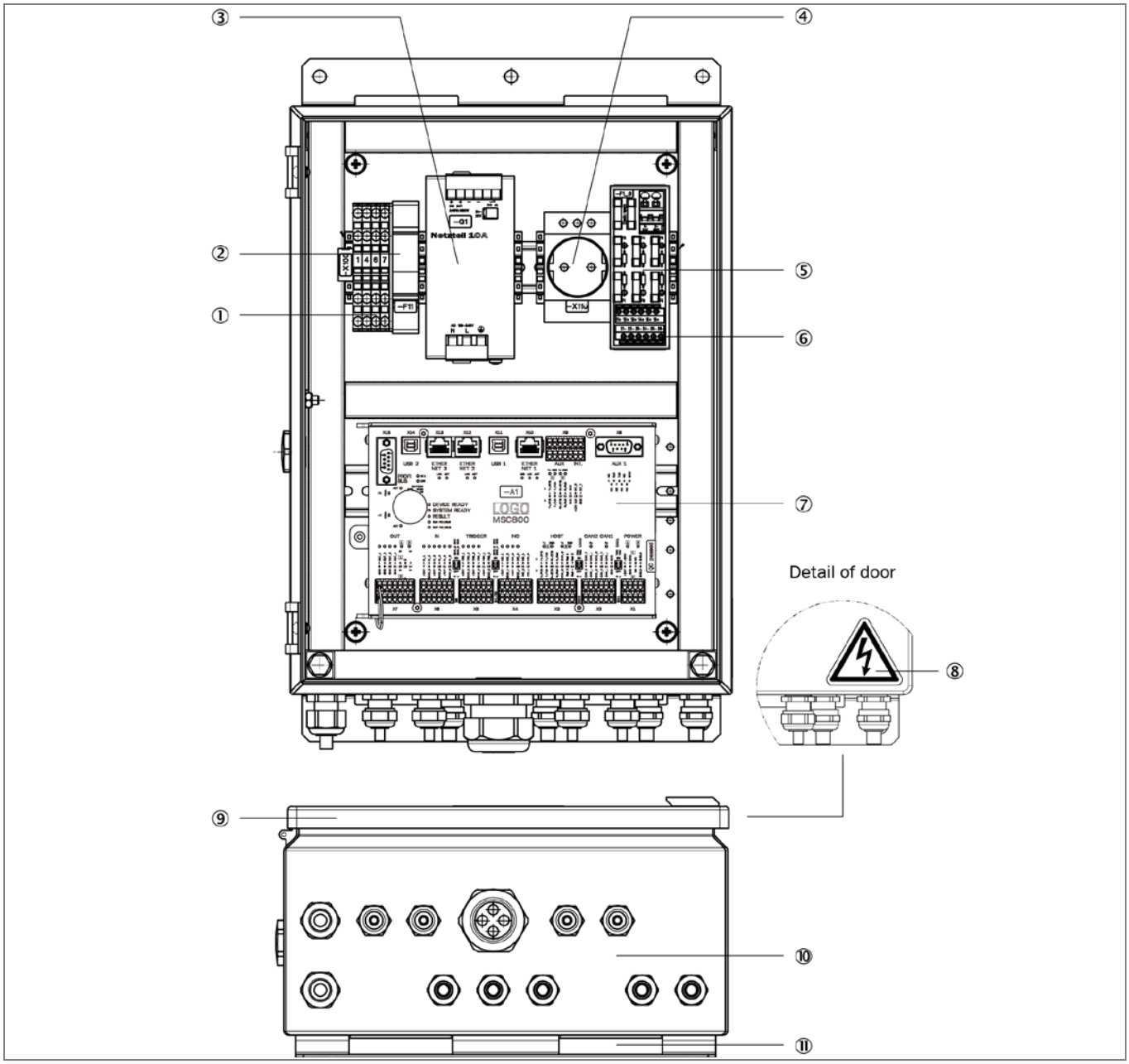


Fig. 2: MSC800-1100 device view (internal view with open door and view from below)

No.	Power consumption	No.	Power consumption
1	Terminals for mains voltage IN (AC 100 ... 264 V / 50 ... 60 Hz)	6	Terminals for supply voltage OUT (DC 24 V, max. 10 A)
2	Circuit breaker for protective contact socket and power supply unit module	7	Logic unit with connections and SD memory card for parameter cloning
3	Power supply unit module 10 A for supply voltage DC 24 V	8	“Hazardous electrical voltage” warning symbol
4	Protective contact socket (mains voltage)	9	Door
5	Fuses for supply voltage OUT DC 24 V	10	Cable entries (M screw connections)
		11	Perforated sheet for mounting (2 x)

3.1.2 MSC800-2100 device view

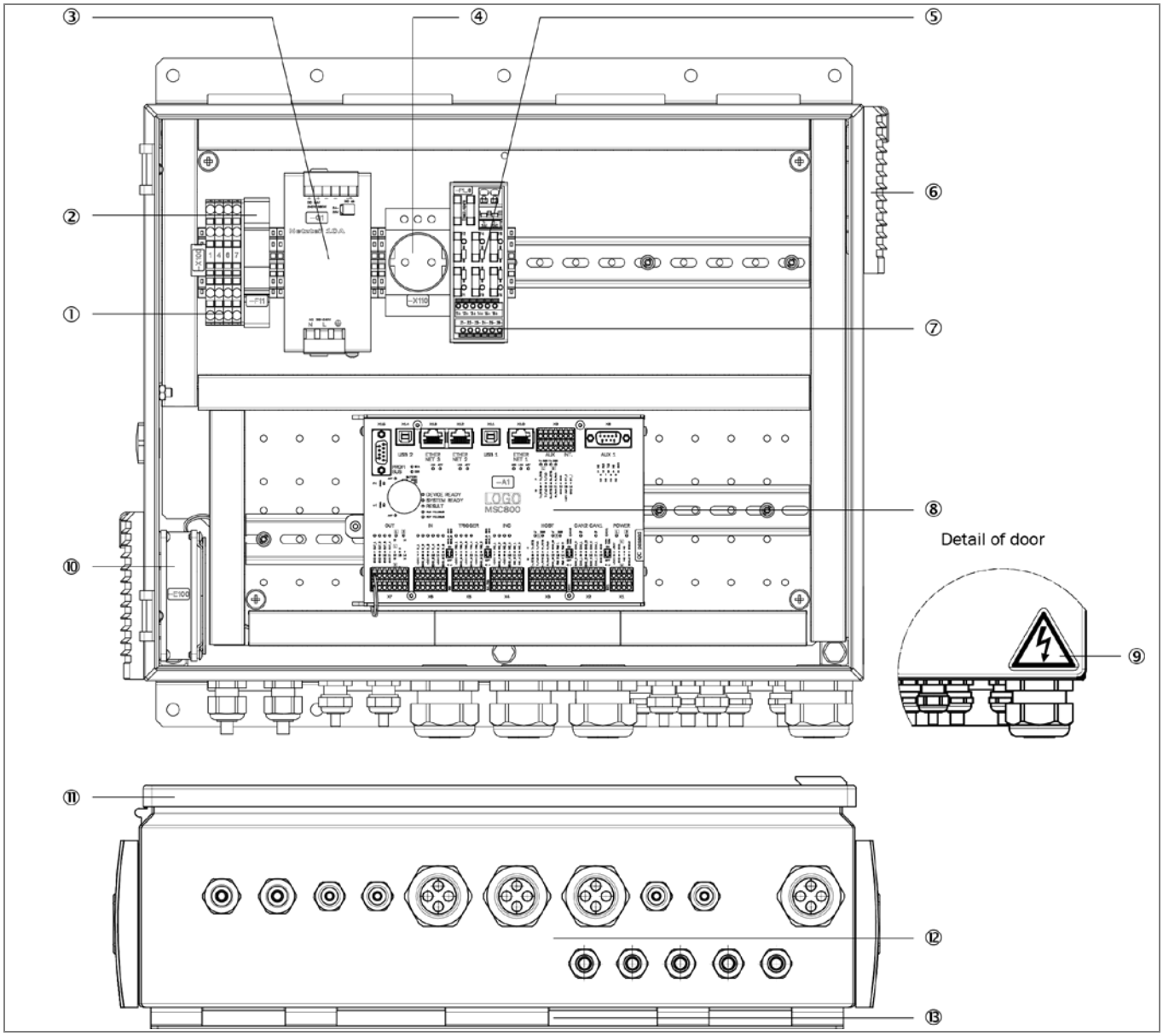


Fig. 3: MSC800-2100 device view (internal view with open door and view from below)

No.	Power consumption	No.	Power consumption
1	Terminals for mains voltage IN (AC 100 ... 264 V / 50 ... 60 Hz)	8	Logic unit with connections and SD memory card for parameter cloning
2	Circuit breaker for protective contact socket and power supply unit module	9	“Hazardous electrical voltage” warning symbol
3	Power supply unit module 10 A for supply voltage DC 24 V	10	Air inlet for cooling (with fan and filter mat)
4	Protective contact socket (mains voltage)	11	Door
5	Fuses for supply voltage OUT DC 24 V	12	Cable entries (M screw connections)
6	Air outlet for cooling (with filter mat)	13	Perforated sheet for mounting (2 x)
7	Terminals for supply voltage OUT (DC 24 V, max. 10 A)		

3.1.3 MSC800-2300 device view

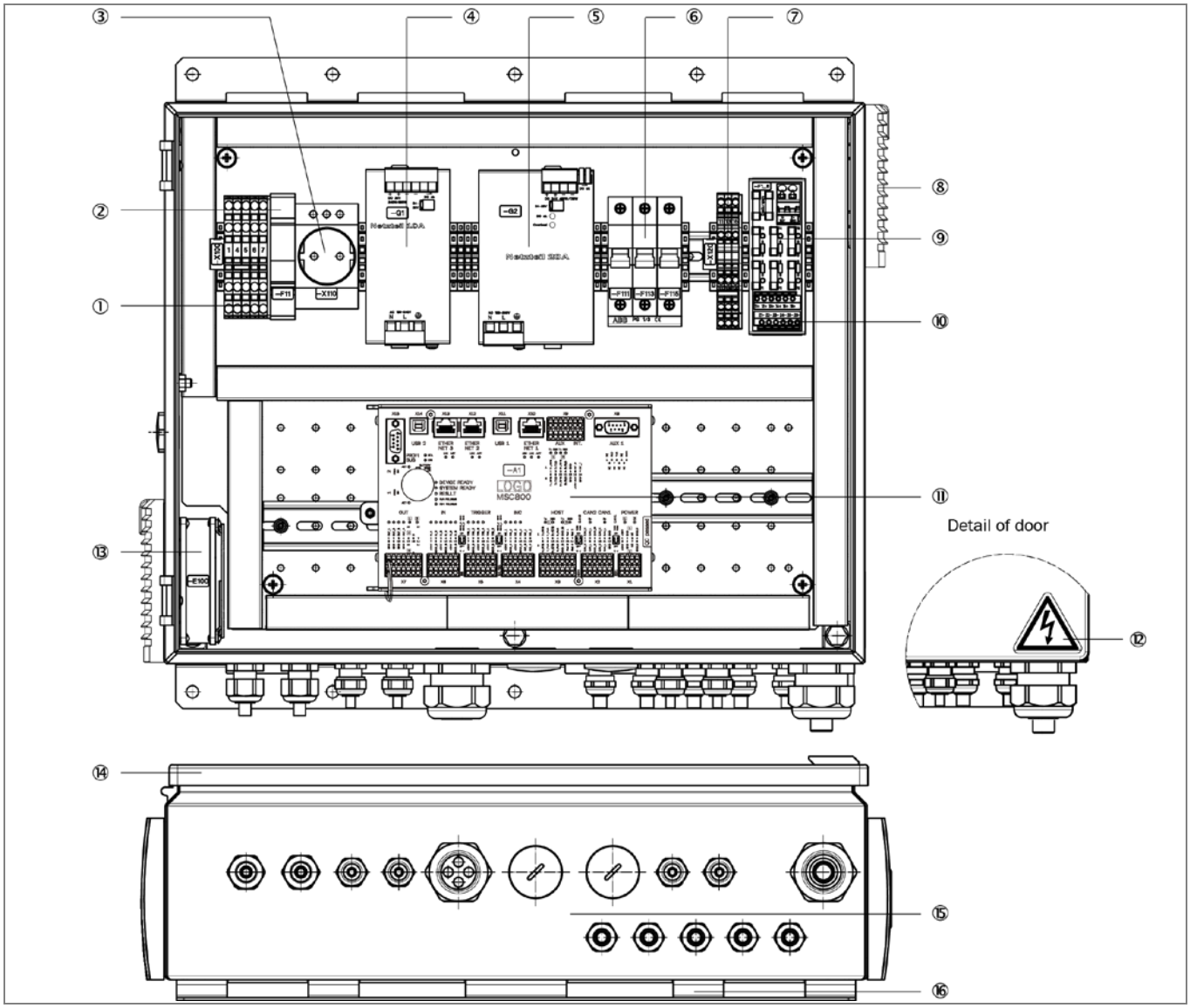


Fig. 4: MSC800-2300 device view (internal view with open door and view from below)

No.	Power consumption	No.	Power consumption
1	Terminals for mains voltage IN (AC 100 ... 264 V / 50 ... 60 Hz)	9	Fuses for supply voltage OUT 1 DC 24 V
2	Circuit breaker for protective contact socket and power supply unit modules	10	Terminals for supply voltage OUT 1 (DC 24 V, max. 10 A)
3	Protective contact socket (mains voltage)	11	Logic unit with connections and SD memory card for parameter cloning
4	Power supply unit module 10 A for supply voltage OUT 1 DC 24 V	12	“Hazardous electrical voltage” warning symbol
5	Power supply unit module 20 A for supply voltage OUT 2 DC 24 V	13	Air inlet for cooling (with fan and filter mat)
6	Automatic circuit breakers (supply voltage OUT 2), 3 x	14	Door
7	Terminals for supply voltage OUT 2 (DC 24 V, max. 20 A)	15	Cable entries (M screw connections)
8	Air outlet for cooling (with filter mat)	16	Perforated sheet for mounting (2 x)

3.1.4 MSC800-3400 device view

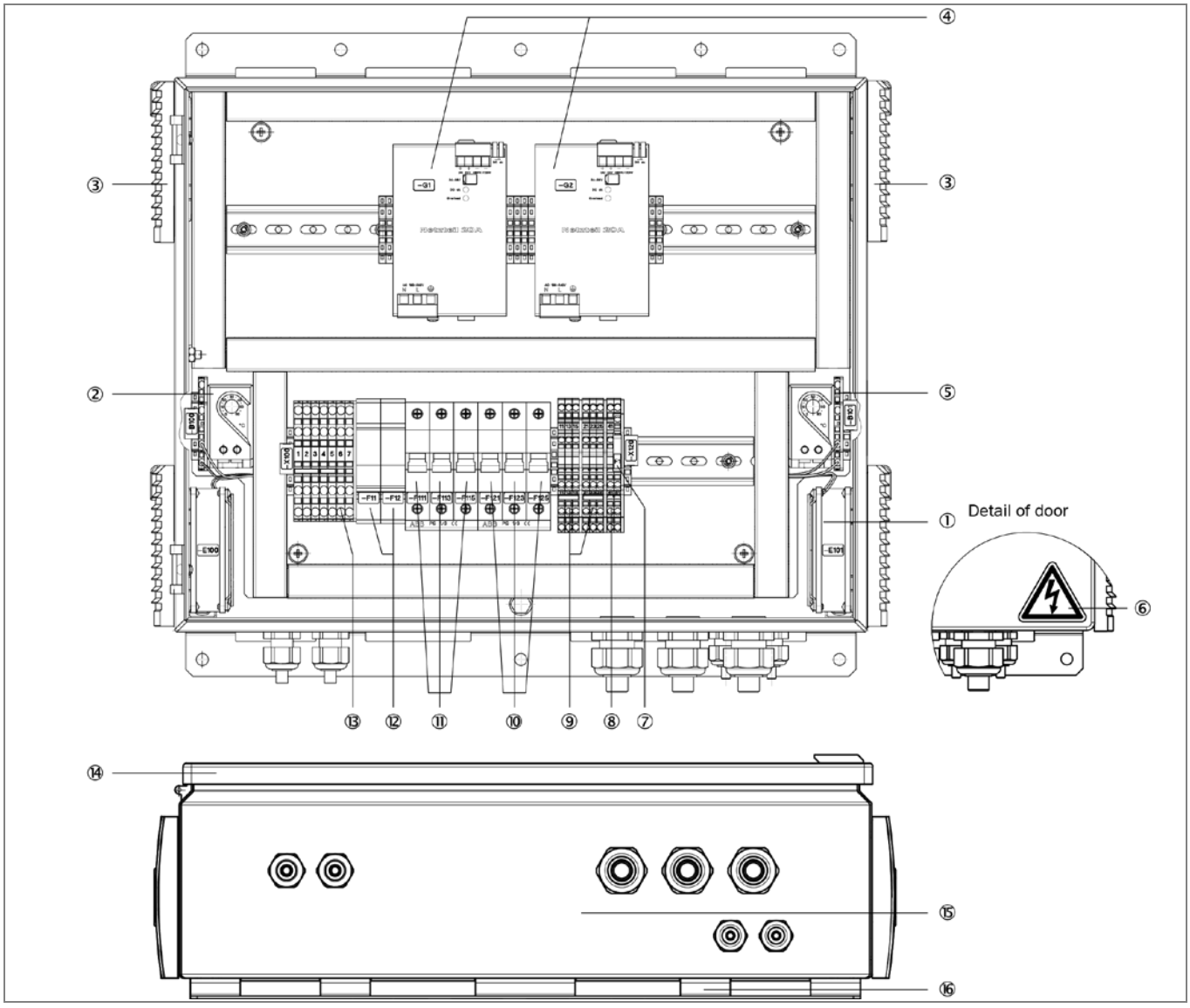


Fig. 5: MSC800-3400 device view (internal view with open door and view from below)

No.	Power consumption	No.	Power consumption
1	Air inlet opening for cooling (with fan and filter mat), 2 x	9	Terminal sets for supply voltage OUT 2 to 1 (DC 24 V, 2 x max. 20 A)
2	Thermal circuit breaker with N/C contact for excess temperature signaling	10	Automated circuit breakers (supply voltage OUT 2)
3	Air outlet for cooling (with filter mat), 2 x	11	Automated circuit breakers (supply voltage OUT 1)
4	Power supply unit module 20 A for supply voltage DC 24 V, 2 x	12	Circuit breaker for power supply unit modules
5	Thermal circuit breaker with N/O contact for switching the two fans on/off	13	Terminals for mains voltage IN (AC 100 ... 264 V / 50 ... 60 Hz)
6	“Hazardous electrical voltage” warning symbol	14	Door
7	Fuse for both fans	15	Cable entries (M screw connections)
8	Terminals for N/C contact (thermal circuit breaker)	16	Perforated sheet for mounting (2 x)

3.1.5 MSC800-3600 device view

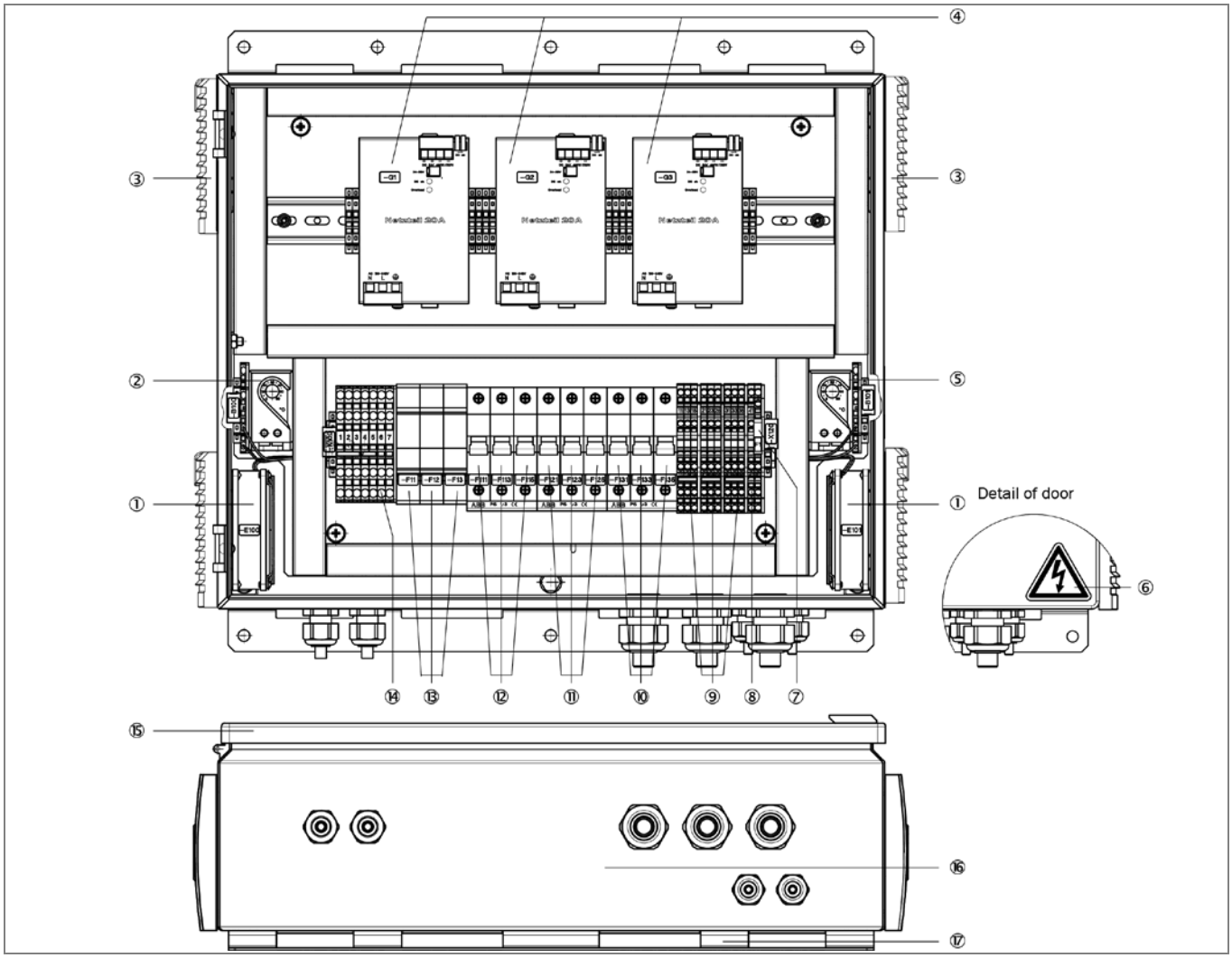


Fig. 6: MSC800-3600 device view (internal view with open door and view from below)

No.	Power consumption	No.	Power consumption
1	Air inlet opening for cooling (with fan and filter mat), 2 x	9	Terminal sets for supply voltage OUT 3 to 1 (DC 24 V, 3 x max. 20 A)
2	Thermal circuit breaker with N/C contact for excess temperature signaling	10	Automatic circuit breakers (supply voltage OUT 3)
3	Air outlet for cooling (with filter mat), 2 x	11	Automated circuit breakers (supply voltage OUT 2)
4	Power supply unit module 20 A for supply voltage DC 24 V, 3 x	12	Automated circuit breakers (supply voltage OUT 1)
5	Thermal circuit breaker with N/O contact for switching the fans on/off	13	Circuit breaker for power supply unit modules
6	“Hazardous electrical voltage” warning symbol	14	Terminals for mains voltage IN (AC 100 ... 264 V / 50 ... 60 Hz)
7	Fuse for both fans	15	Cable entries (M screw connections)
8	Terminals for N/C contact (thermal circuit breaker)	16	Door
		17	Perforated sheet for mounting (2 x)

3.1.6 Scope of delivery

Control cabinet variants

The delivery of the MSC800 in the cabinet includes the following components:

No. of units	Component	Note
1	MSC800-1100 - **or** - MSC800-2100 - **or** - MSC800-2300	Without connecting cables. With MSC800-0000 logic unit.
	MSC800-3400	Optional additional power supply unit modules for supplying the ID sensors
	MSC800-3600	Optional additional power supply unit modules for supplying the ID sensors
1	Notes on the device for initial information (no. 8011538)	Included in the MSC800 device packaging
1	“Manual & Software Identification & Measuring” DVD	
	MSC800 operating instructions in German and/or English as a printout	Optional, depending on the number of issues explicitly ordered on purchase

Tab. 4 Scope of delivery for MSC800 modular system controller in cabinet

Individual components of the logic unit

The delivery of the MSC800-0000 includes the following components:

No. of units	Component	Note
1	MSC800-0000	Without connecting cables
1	Notes on the device for initial information (no. 8012115)	Included in the device packaging of the MSC800-0000
1	“Manual & Software Identification & Measuring” DVD	
	MSC800 operating instructions in German and/or English as a printout	Optional, depending on the number of issues explicitly ordered on purchase

Tab. 5 MSC800-0000 logic unit scope of delivery

An overview of the device variants, accessories that can be supplied, incremental encoder, cables, and plug connectors is provided in chapter **10.3 Ordering information** on page 119.

3.1.7 Content of the DVD (no. 2039442)

- SOPAS-ET Engineering Tool: configuration software for WindowsTM PCs with integrated online help system (HTML files).
- MSC800 operating instructions: PDF version in German and English, as well as other publications for ICR890, VMS4xx/5xx, CLV490, V6xx, etc.

Important The latest versions of the publications and programs included on the DVD are also available for download at **www.sick.com**.

3.1.8 Device variants

The MSC800 is available in the following variants:

Type	Part no.	Description
MSC800-0000	1040571	Logic unit as individual component*
MSC800-1100	1040385	Logic unit with power supply unit (10 A), in the control cabinet 300 x 400 x 155 mm3, without fan
MSC800-2100	1041611	Logic unit with power supply unit (10 A), in the control cabinet 500 x 400 x 155 mm3, with one fan
MSC800-2300	1040386	Logic unit with power supply unit (30 A), in the control cabinet 500 x 400 x 155 mm3, with one fan
MSC800-3400	1041770	Additional power supply unit (40 A), in the control cabinet 500 x 400 x 155 mm3, with two fans, for combination with MSC800-2100/-2300
MSC800-3600	1040387	Additional power supply unit (60 A), in the control cabinet 500 x 400 x 155 mm3, with two fans, for combination with MSC800-2100/-2300
* For installation regulations, see chapter **4.3.2 Mounting individual components of the logic unit** on page 40		

Tab. 6 Variants of the MSC800

The MSC800-2300 can be combined with additional MSC800-3400/-3600.

Other variants are available upon request.

3.2 System requirements

3.2.1 Mounting requirements

- Stable mounting frame with sufficient load-bearing capacity and with appropriate dimensions for the cabinet of the MSC800 (see the information in the dimensional drawings in the Annex).
- Shock and vibration-free mounting

3.2.2 Electrical installation requirements

- Supply voltage: AC 100 ... 264 V / 50 ... 60 Hz.
- Read cycle sensor (start/stop), e.g., photoelectric retro-reflective sensor (included with delivery): for reporting of an object in the case of external read cycle.
- Additional suitable read cycle sensor (stop), e.g., photoelectric retro-reflective sensor: for reporting the PSDI end in the case of extended external read cycle.
- Optional suitable incremental encoder, e.g., no. 2039455 (resolution 10 mm/clock) or no. 2039457 (resolution 0.2 mm/clock) when using the VMS4xx/5xx. Device is included with delivery depending on the system configuration
- Host computer with RS-232, RS-422/485, Ethernet, or PROFIBUS-DP data interface for further processing of the read data.
- Suitable visualization device or PLC for issuing the system status

3.2.3 Operation requirements

PC in following version

- At least Pentium II (Pentium III recommended), 350 MHz (500 MHz recommended), 64 MB RAM (512 MB recommended), DVD drive, serial data interface RS-232 or Ethernet interface card, mouse (recommended), and color screen (recommended resolution 1024 x 768 pixel).
- Operating system Windows 2000™, XP™, Vista™, Windows 7™, Windows 8™.

HTML browser on PC, e.g., Internet ExplorerTM

For online help system for the SOPAS-ET configuration software.

3.3 Product features and functions (overview)

Performance need	Characteristic
Safety and ease of use	• Control cabinet variant: reliable, compact metal cabinet, enclosure rating IP 65/IP 54, CE marking • Automatic self-test at system start • Diagnostic tools for system setup and (remote) system monitoring • Configurable output of reading diagnostic data in two reading results formats • Operating data polling, in case of error, issue of error code if required • Test string function (heartbeat) can be activated to signal that the device is ready for operation • Password-protected configuration mode • Saving of the configured parameter values (cloning) in addition to on the SD memory card of the logic unit (can be removed when replacing the logic unit) • Future-proof through firmware update (FLASH PROM) via data interface • Future-oriented SOPAS-ET configuration software • Additional supply voltage range (mains voltage IN) • Cooling of the cabinet by fans (not MSC800-1100) • Option to signal excess temperature in the cabinet (MSC800-1100/-2100/-2300) • Components of the MSC800 (logic unit, power supply unit module) can each be replaced within 5 min
Convenient operation/configuration	• Configuration (online/offline) and display of the image memory content via SOPAS-ET configuration software (incl. help system) • Status displays of the connections on the logic unit via LEDs
Read operation modes	• Start/stop operation • Object tracking
Read cycle	• External read cycle via switching input(s) or data interface
1D / 2D code assessment	• Data matrix ECC200 (PDF417 being prepared)/all common bar codes • Separation of identical codes of the same code type by position in the image memory/read angle along the scan line
Data processing	• Influencing the reading data by event-dependent assessment conditions • Influencing the output string by filters and output sorting options
Data communication	• HOST main data interface: two output formats can be configured for the reading result, communication can be switched to various physical interfaces, parallel operation possible • AUX auxiliary data interface: fixed output format with special diagnostic functions, communication can be switched to various physical interfaces, parallel operation possible
Electrical Interfaces	• HOST data interface: serial RS-232, RS-422/485, Ethernet or PROFIBUS-DP (various configurations of transmission rate and protocol possible) • AUX data interface: serial RS-232, RS-422/485, Ethernet (transmission rate, data format, and protocol fixed), USB • CAN interface for integration of the ID sensors and of the VMS4xx/5xx into the SICK CAN SENSOR network or into a CANopen® network • Ethernet interface (10/100 MBit/s), TCP/IP and FTP • Four digital switching inputs for external read cycle sensor, via optocoupler • Four digital switching inputs for incremental encoder, via optocoupler • Six digital switching inputs for assignable special functions • Four digital switching outputs and two relay outputs for signaling definable events in the read events or in system statuses
Connectivity (design)	• Data and function interfaces: spring-loaded terminals, D-Sub, RJ45, USB type B • Supply voltage: spring-loaded terminals

Tab. 7 Product features and functions (overview)

3.4 Operating principle of the MSC800

ID sensors are operated in combination with an MSC800 for automated and non-contact recording and decoding of 1D / 2D codes. The read results of the ID sensors are output on the data interfaces of the MSC800. External sensors provide information about the read cycle, the object distance and the conveyor speed. This information is then distributed to the systems by the MSC800.

Fig. 7: MSC800 in combination with ID sensors for 1D / 2D codes on a conveyor system

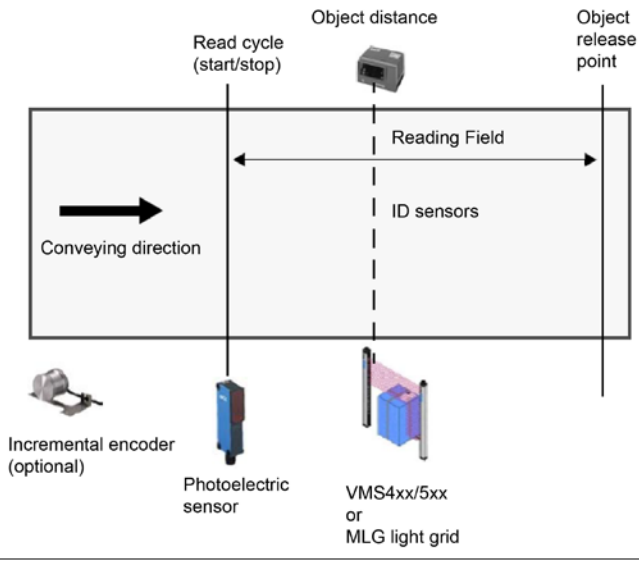


Fig. 8: Diagram of the system (top view)

By combining several ID sensors, it is possible to record several sides in one passage (multi-side reading). In this case, the MSC800 carries out the coordination of the sensors.

3.4.1 Object trigger control

The ID sensors need a suitable signal (trigger) to start an object-related read process. As standard, the start signal is issued via an external read cycle sensor (photoelectric sensor). As soon as an object has passed the read cycle sensor, an “internal reading interval” is opened for the reading process. The signal is distributed to the ID sensors via the MSC800.

Alternatively, a command triggers the read process via a data interface or the CAN-SENSOR network.

The trigger source can be configured with the SOPAS-ET configuration software: PROJECT TREE, MSC800, PARAMETERS, OBJECT TRIGGER CONTROL, tab START/STOP THE OBJECT TRIGGER

3.4.2 Focus control

For dynamic focusing (focus control), the ICR890 system needs continuous information about the distance to the object surface. In the case of reading from above, this data is supplied by a lateral MLG light grid. During reading from the side, the dimensions of the object are recorded by the VMS4xx/5xx volume measurement system and processed via the MSC800.

The SOPAS-ET configuration software can be used, among other things, to configure the default focus position and the source of the distance measurement:

PROJECT TREE, MSC800, PARAMETERS, MLG SETTINGS, GENERAL tab

PROJECT TREE, MSC800, PARAMETERS, NETWORK/INTERFACES/OIS, SERIAL, tab SERIAL AUX INTERFACE

3.4.3 Increment configuration

The ID sensors need information about the conveyor speed in order to control the tracking information. An external incremental encoder provides pulses, from which the current conveyor speed is determined.

The conveyor speed is derived from the number of pulses and the resolution of the external incremental encoder.

The SOPAS-ET configuration software can be used to configure the increment source and the resolution/speed:

PROJECT TREE, MSC800, PARAMETERS, INCREMENT, tab INCREMENT

3.4.4 Code configuration

The recorded codes are already decoded by the ID sensors. The results are forwarded to the MSC800. The following code types can be filtered there:

1D codes (bar codes)

- Codebar
- Code 39
- UPC/EAN family
- 2/5 Interleaved
- Code 93
- Code 128 family

2D codes (only ICR890 system)

- Data Matrix EEC200
- PDF417
- QR code
- MaxiCode

The SOPAS-ET configuration software can be used to select the code types for 1D and 2D codes:

PROJECT TREE, MSC800, PARAMETERS, 1D CODE, tab CODE TYPES

PROJECT TREE, MSC800, PARAMETERS, 2D CODE, tab CODE TYPES

The selected code types can be individually configured. In each case, there are tabs for doing this in the SOPAS-ET configuration software.

3.4.5 Read operating modes

Start/stop operation

In start/stop operation, there is only ever one object in the reading field during the reading process, i.e., all read codes can be clearly assigned to the object. As standard, starting and stopping of the reading process are controlled by two read cycle sensors at the start and end of the reading field.

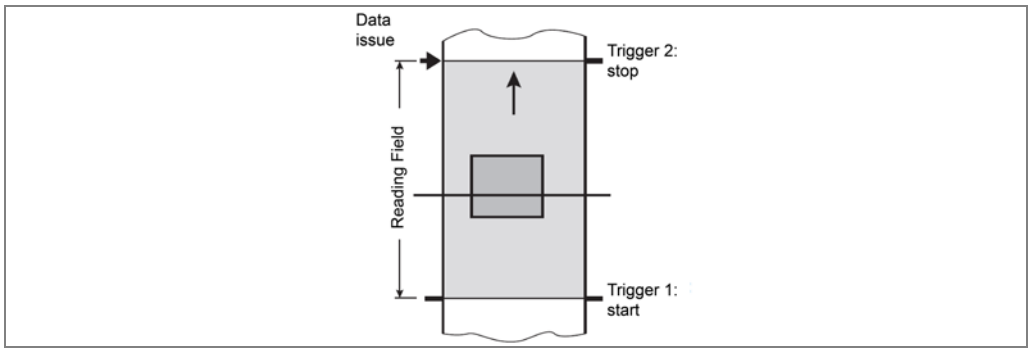


Fig. 9: Read operating modes (start/stop operation), side reading from above

In this case, the distance between the sensors determines the size of the reading field. The reading process can alternatively be controlled with command strings via the data interface. The output of the read results is either carried out at the end of the read cycle (the rear edge of the object has left the end of the reading field) or even during the read cycle if certain configurable conditions are met.

Tracking operation

In the internal tracking operation, there are a maximum of 10 objects behind each other in the reading field at the same time during the reading process, i.e., the read codes must be able to be clearly assigned to the objects.

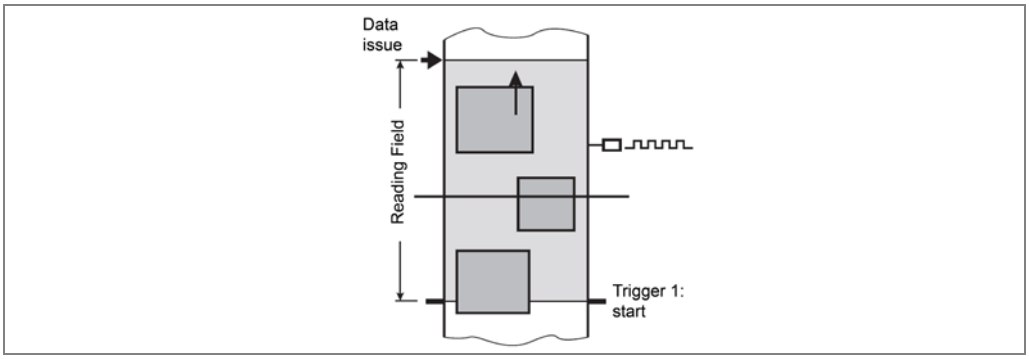


Fig. 10: Read operating modes (tracking operation), side reading from above

As standard, the start of the reading process is controlled by a read cycle sensor at the start of the reading field (see chapter **3.4.1 Object trigger control** on page 29), the end defines the specification of the object release point. This also defines the size of the resulting reading field.

In order to be able to track the transport of the objects in the reading field, a regular clock is required. This is generated by the external incremental encoder, which constantly provides at least one pulse per 10 mm movement in the conveyor direction (see chapter **3.4.3 Increment configuration** on page 29). This provides a clear temporal representation of the route between the read cycle sensor and object release point. Jittering when the conveyor technology is starting up or in the event of slowing down when there is a high load with lots of objects to convey is therefore also recorded. A gap of at least 50 mm is necessary for clear separation of successive objects. The issuing of the read result for an object is carried out after the rear edge of the object passes the object release point. The reading process can alternatively be started with a command string via the data interface.

The SOPAS-ET configuration software can be used to configure the read operating mode, the object release point, and the time of issuing the read result:

PROJECT TREE, MSC800, PARAMETERS, DATA PROCESSING, tab TRACKING

PROJECT TREE, MSC800, PARAMETERS, DATA PROCESSING, OUTPUT CONTROL

3.4.6 Data processing

The SOPAS-ET configuration software can be used to configure result-dependent assessment conditions as well as filters and sorting for the output formating of the read result:

PROJECT TREE, MSC800, PARAMETERS, DATA PROCESSING, ASSESSMENT CONDITIONS

PROJECT TREE, MSC800, PARAMETERS, DATA PROCESSING, FILTER/SORTER FOR THE OUTPUT FORMATING

3.4.7 Output formats

The read results (decoded codes) of the host interface can be output via selectable physical data interfaces. Two different output formats (telegrams) can be defined for this purpose. In addition, an output format can be defined for failed decoding (“No Read”), as well as an output format for the heartbeat.

The SOPAS-ET configuration software can be used to configure the output formats:

PROJECT TREE, MSC800, PARAMETERS, DATA PROCESSING, OUTPUT FORMAT

3.4.8 Network

In the event of multi-side reading, the MSC800 carries out the coordination of the ID sensors. The sensors and the MSC800 can be networked together via CAN bus.

The SOPAS-ET configuration software can be used to configure the network parameters:

PROJECT TREE, MSC800, PARAMETERS, NETWORK/INTERFACES/IOS, tabs NETWORK OPTIONS and MASTER/SLAVE

3.4.9 Data interfaces

Numerous data interfaces are available on the logic unit of the MSC800.

Interface	Connection	Function
Serial host interfaces	HOST 1, HOST 2	Providing the read result in two output formats or in customer-specific formats/with customer-specific protocols for further processing by the host computer
Serial auxiliary interfaces	AUX 1, AUX 2	Read diagnosis and monitoring of the host interfaces, providing the read result in customer-specific formats/with customer-specific protocols, connecting to the RDT400 tool.
Ethernet	ETHERNET	Host port: Providing the read result in two output formats or in customer-specific formats/with customer-specific protocols for further processing by the host computer Aux port: Read diagnosis and monitoring of the host interfaces, providing the read result in customer-specific formats/with customer-specific protocols, connecting to the RDT400 tool.
CAN bus	CAN 1 (Out/In), CAN 2 (Out/In)	Networking the MSC800 with one or more ICR890 systems
PROFIBUS-DP	PROFIBUS	Providing the read result for further processing by the host computer

Tab. 8 Function of data interfaces

The SOPAS-ET configuration software can be used to configure the data interfaces:

PROJECT TREE, MSC800, PARAMETERS, NETWORK/INTERFACES/IOS, SERIAL PROJECT TREE, MSC800, PARAMETERS, NETWORK/INTERFACES/IOS, ETHERNET PROJECT TREE, MSC800, PARAMETERS, NETWORK/INTERFACES/IOS, CAN PROJECT TREE, MSC800, PARAMETERS, NETWORK/INTERFACES/IOS, PROFIBUS

3.4.10 Digital switching outputs

In the case of certain events in the read process (e.g., in the event of failed decoding “No Read”), independent switching signals can be output on the four digital outputs, which are used to display the status of the read result. In addition, it is possible to signal system statuses (operational readiness, excess temperature in the cabinet).

The SOPAS-ET configuration software can be used to configure the digital switching outputs:

PROJECT TREE, MSC800, PARAMETERS, NETWORK/INTERFACES/IOS, DIGITAL OUTPUTS, tabs OUTPUT 1 to OUTPUT 4

3.4.11 Relay switching outputs

The MSC800 also provides two relay switching outputs (changeover contacts). These can be used to achieve the same switching functions as in the digital outputs.

The SOPAS-ET configuration software can be used to configure the two relay outputs:

PROJECT TREE, MSC800, PARAMETERS, NETWORK/INTERFACES/IOS, DIGITAL OUTPUTS, tabs RELAY 1 and RELAY 2

3.4.12 Digital switching inputs

It is possible to connect, for example, the external sensor for the object trigger control (photoelectric sensor) and the incremental encoder to the 10 digital switching inputs.

The SOPAS-ET configuration software can be used to configure the digital inputs:

PROJECT TREE, MSC800, PARAMETERS, NETWORK/INTERFACES/IOS, DIGITAL INPUTS, tabs INPUT 1 to INPUT 6

PROJECT TREE, MSC800, PARAMETERS, NETWORK/INTERFACES/IOS, DIGITAL INPUTS, tabs TRIGGER 1 to TRIGGER 4

3.5 Operating elements and displays

3.5.1 Operator interface

The MSC800 is configured according to the application via the SOPAS-ET configuration software (see chapter **6.3.1 Overview of the configuration steps** on page 75). For this purpose, the software runs on a PC, which must be connected to one of the data interfaces (“AUX”, RS-232, “ETHERNET”, or “USB”) of the MSC800.

As an alternative to the SOPAS-ET configuration software, command strings are available, upon which the operator interface of the SOPAS-ET configuration software is also based (see chapter **10.2 Configuration with command strings** on page 118).

Commissioning and diagnostics in the event of faults are carried out exclusively via the SOPAS-ET configuration software. In normal operation, the MSC800 operates fully automatically. There are no other operating elements on the MSC800.

Parameter set on the SD memory card

The configured parameter values are saved as a parameter set in the internal EEPROM of the MSC800 and on the SD memory card (SD 1) of the logic unit (cloning). If the logic unit has to be replaced, the memory card makes transferring the parameter set to the new device quick and easy (see chapter **7.5 Replacing components of the MSC800** on page 84).

Important

In order to avoid data loss, the SD memory card may only be removed from or inserted into the new device when the MSC800 is switched off.

The card can be accessed on the left side of the MSC800 logic unit.

Fig. 11: Position of the SD memory card for parameter set on the MSC800-0000 logic unit

3.5.2 Function of the LEDs

The accessible LEDs of the MSC800 are on the power supply unit modules, on the fuse module for the supply voltage DC 24 V (CLV490, VMS4xx/5xx, logic unit; only MSC800-1100, MSC800-2100 and MSC800-2300), and on the logic unit.

Installation site	LED	Color	Meaning	Note
Power supply unit modules	DC ok	Green	ON: power supply unit ready for operation OFF: no input voltage (mains voltage) ON: voltage drop, short-circuit “Overload” LED lights up OFF: shutdown due to overheating “Overload” LED flashing	If OFF, remove cause (lack of input voltage/overload)
	Overload	Red	OFF: power supply unit ready for operation ON:voltage drop, short-circuit Flashing: power supply unit overheated The power supply unit module disconnects the DC 24 V output voltage from the consumer by means of the internal relay.	Remove the cause of the overload
Fuse module DC 24 V supply voltage	Fault (F1 to F6)	Red	The LEDs light up if the fuse for the relevant terminal is defective. The fuses are assigned to the terminals as follows: F1/terminal 11+, F2/terminal 12+, F3/terminal 13+, F4/terminal 14+, F5/terminal 15+, F6/terminal 16+	Only MSC800-1100, -2100, -2300 Remove cause of overload and replace fuse

Installation site	LED	Color	Meaning	Note
Logic unit	DEVICE READY	Green	ON: MSC800 ready for operation OFF: MSC800 not ready for operation	
	SYSTEM READY	Green	ON: overall system made up of MSC800 and all connected sensors ready for operation OFF: overall system not ready for operation	
	RESULT	Green	ON: there is a valid read result OFF: no valid read result	
	RUN FIELDBUS	Green	ON: fieldbus communication active OFF: no fieldbus communication	
	READY FIELDBUS	Green	ON: fieldbus application ready OFF: fieldbus application not ready	
	OUT	Green	ON: switching output active OFF: switching output inactive	
	IN, TRIGGER, INC	Green	ON: switching input active OFF: switching input inactive	
	POWER (1/2)	Green	ON: supply voltage on OFF: no supply voltage	
	micro SD ACT	Green	ON: MSC800 reading/writing data from/to SD card OFF: inactive	
	PROFIBUS STA ERR	Green green	ON: data interface ready for communication ON: bus or communication error	
	ETHERNET LNK ACT 100	Green green green	ON: data interface connected to Ethernet ON: data transfer ON: data transmission rate 100 MBit/s OFF: data transmission rate 10 MBit/s	
	HOST (1/2) AUX (1/2) Tx 232	Green green	ON: data interface is sending data ON: interface is working as an RS-232 interface ON: interface is working as an RS-422/485 interface	
	CAN 1/2 Rx	Green	ON: data interface is receiving data	

Tab. 9 Meaning of the LEDs

4 Mounting

4.1 Overview of the mounting steps

This chapter describes the mounting steps for the MSC800 and the external components.

Important Mounting requirement:

- Control cabinet variants: appropriate mounting frame at the mounting location. The mounting frame must be constructed according to the specifications of a project-specific dimensional drawing.
- Individual components of the logic unit: metallic control cabinet provided by the customer.

The following list shows the overview of the typical mounting steps:

- Mounting and alignment of the ID sensors
- Mounting of other external components
- Mounting of the MSC800

4.2 Preparation for mounting

4.2.1 Getting the components to be mounted ready

The following components must be prepared for mounting:

Control cabinet variants

- 1 x MSC800-1100 or
- 1 x MSC800-2100 or
- 1 x MSC800-2300 or
- 1 x MSC800-2100/-2300 and 1 x MSC800-3400/-3600 or
- 1 x MSC800-2100/-2300 and 2 x MSC800-3400/-3600.

Individual components of the logic unit

- 1 x MSC800-0000

For other components and ID sensor, see chapter **4.4 Mounting of external components** on page 41.

4.2.2 Getting the accessories ready

The following accessory parts must be provided for mounting:

- Fixing screws for MSC800-1100 (max. 6 hexagon socket screws M8)
- Fixing screws for MSC800-2100/-2300 or MSC800-3400/-3600 (max. 10 hexagon socket screws M8 each)

The following tools and auxiliary equipment are required for mounting:

- Project-specific dimensional drawing
- Key for hexagon socket (6 mm) appropriate for all screws

4.2.3 Selecting the mounting location

Dimensional drawing

The general requirements for the mounting location are described in chapter **3.2.1 Mounting requirements** on page 26. The project-specific information (position of the components, distances, angle, etc.) are summarized in a dimensional drawing and must be complied with when mounting the components.

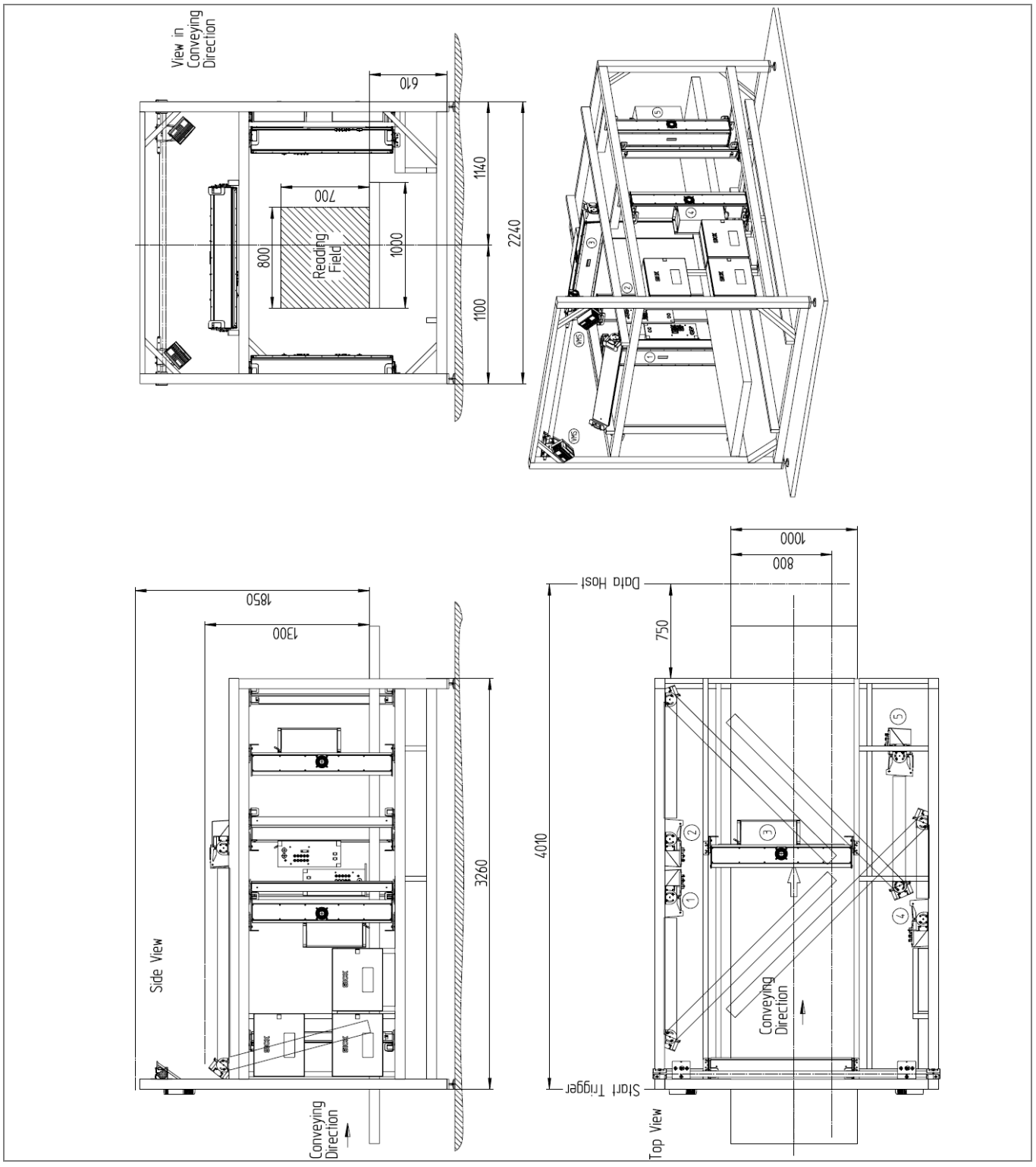


Fig. 12: Example of a project-specific dimensional drawing for mounting

4.2.4 Placement on the conveyor system

The placement of the components on the conveyor system depends on project-specific requirements and on the number of ID sensors.

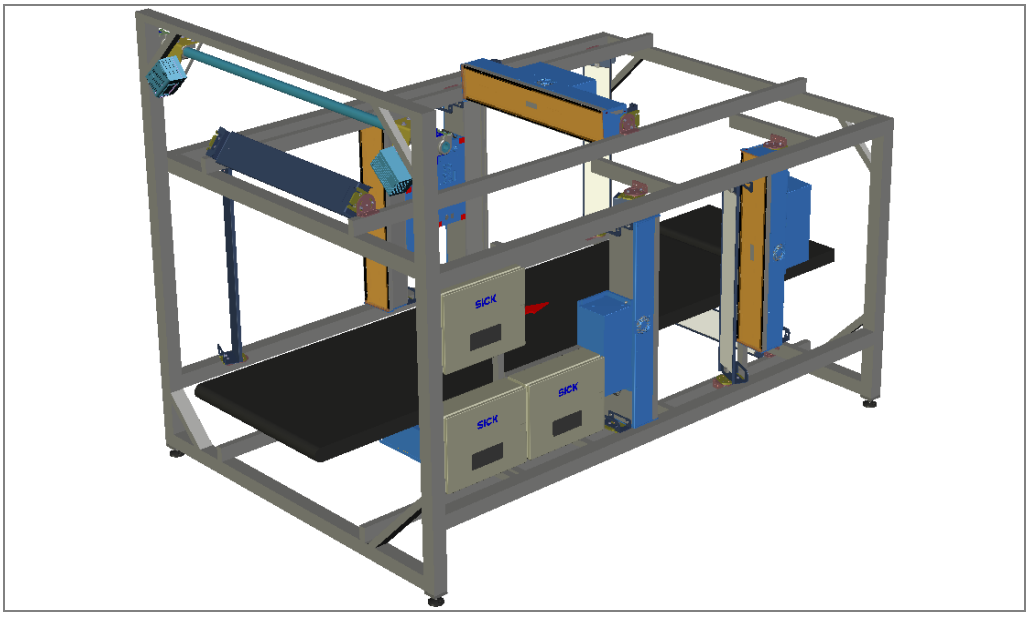


Fig. 13: Placement of several ICR890 systems on the conveyor system with VMS4xx/5xx

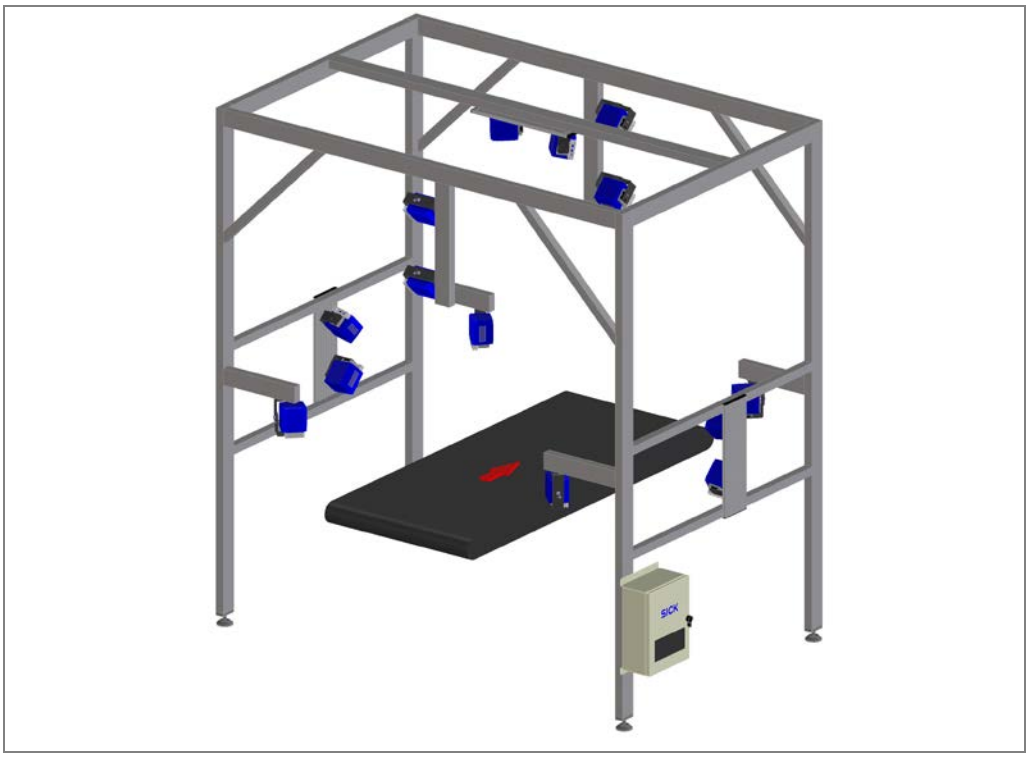


Fig. 14: Placement of several CLV490 bar code scanners on the conveyor system

4.3 Mounting

The position of the MSC800 on the mounting frame is specified in a project-specific manner in a dimensional drawing (see chapter **4.2.3 Selecting the mounting location** on page 38). The requirements must be complied with during mounting because the lengths of cable are adjusted to the position of the components.

4.3.1 Mounting the MSC800 control cabinet variants

The MSC800 is secured directly on the mounting frame according to information in the project-specific dimensional drawing. The number of cabinets depends on the project-specific requirements. The position of the cabinets should be chosen to allow cables to be easily routed and the cabinets to be opened easily.

Important

During the mounting of the MSC800-2100/-2300 and MSC800-3400/-3600, it must be ensured that the **lateral air inlet and outlet openings** are not covered.

To change the replaceable filter mats, the covers (louvered grills) can be opened downwards. The cabinet has additional lateral, freely accessible work areas of approx. 140 mm on the left and right.

WARNING

Risk of injury due to falling components

The weight of the MSC800 can be approx. 10 to 20 kg depending on the variant.

- Do not do mounting work alone.
- Have a second person hold the components during mounting.

Screw the cabinet of the MSC800-1100/MSC800-2100/-2300 to the mounting frame close to the reading point using at least four fixing screws.

If necessary, screw cabinets of additional MSC800-3400/3600 onto the mounting frame using at least four fixing screws per cabinet.

4.3.2 Mounting individual components of the logic unit

Installation requirements

In order to ensure correct and safe operation of the MSC800-0000, proceed on the basis of the following installation requirements:

1. Install the device in a metallic control cabinet.
2. Carry out installation and set-up of the device according to current recognized rules of technology, including connecting a protective conductor for electrical safety.
3. Use shielded cables for all data interfaces (serial, CAN, Ethernet) and the connection of the incremental encoder.
4. Apply shielding of the cables for the data interfaces and the incremental encoder on entry into the control cabinet housing.
5. Only commission the entire device after confirming EC conformity.

4.4 Mounting of external components

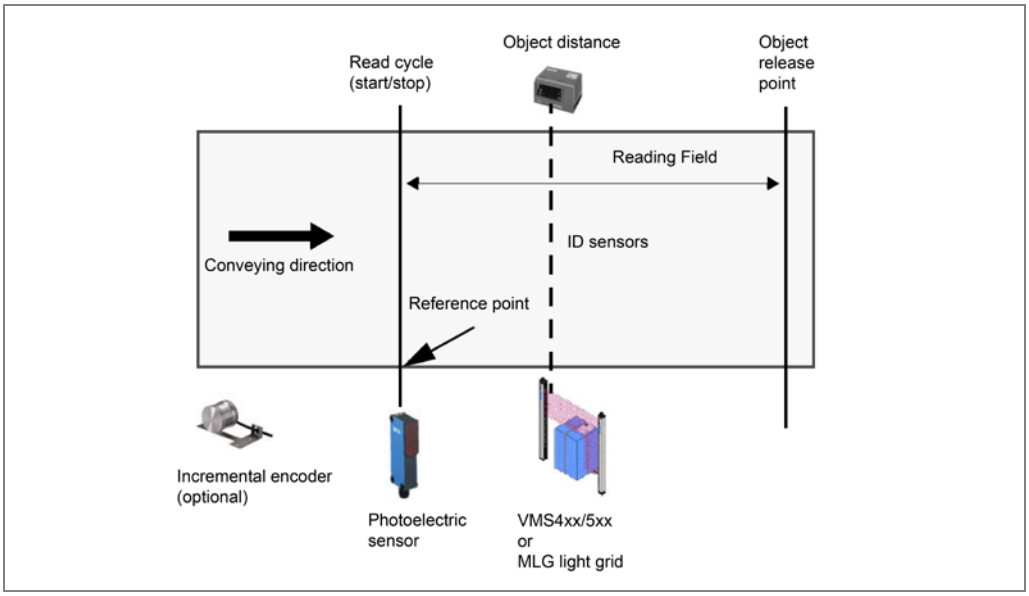


Fig. 15: Position of external components

4.4.1 Mounting ID sensors

The placement of the ID sensors depends on project-specific requirements and on the number of sensors.

1. For each ICR890 system, mount a unit of illumination and camera together with a deflector mirror on the mounting frame.
2. Mount the CLV490 bar code scanner according to the information in the project-specific dimensional drawing.

For additional information see the “High-End CCD Camera System ICR890” (no. 8011324, German version) and “Bar Code Scanner CLV490” (no. 8009992, German version) operating instructions.

4.4.2 External sensors for triggering

The read cycle sensor (photoelectric sensor) is mounted on the right edge of the conveying line according to information in the project-specific dimensional drawing. The position of the photoelectric sensor is the reference point for the position of the other components. As much as possible, the photoelectric sensor must be vertical to the conveying direction.

➢ Mount the photoelectric sensor on the conveying line.

4.4.3 Mounting the incremental encoder

The incremental encoder is mounted directly onto the conveying line according to information in the project-specific dimensional drawing. The position of the incremental encoder should be as near as possible to the reading point.

➢ Mount the incremental encoder at the reading point. When doing so, ensure that the friction gear has direct and secure contact with the conveying surface and does not slip through.

4.4.4 Mounting MLG light grid or VMS4xx/5xx

The MLG light grid or VMS4xx/5xx is secured directly on the mounting frame according to information in the project-specific dimensional drawing. The position of the MLG should be chosen to allow for as large an area as possible to be recorded by the MLG sensors over the conveyor level. The lower sensors must not be permanently covered by the conveyor system.

➢ Mount the MLG light grid or VMS4xx/5xx to the mounting frame.

For additional information, see operating instructions:

“Modular light grid MLG” (no. 8009403, German version) or

“Volume measurement system VMS410/VMS510” (no. 8010591, German version) or

“Volume measurement system VMS420/VMS520” (no. 8010447, German version).

4.5 Dismantling the system

⚠ *WARNING*

Risk of injury due to falling components

The weight of the MSC800 can be approx. 10 to 20 kg depending on the variant.

➢ Do not do mounting work alone.

➢ Have a second person hold the components during mounting.

The dismantling of the MSC800 is described in chapter **7.6 Disposal** on page 87.
The dismantling of individual components of the MSC800 is described in chapter **7.5 Replacing components of the MSC800** on page 84.

Follow the instructions in chapter **7.6 Disposal** on page 87 for environmentally-friendly disposal on final decommissioning.

5 Electrical installation

5.1 Overview of the installation steps

Important Completed mounting of the MSC800 is required for electrical installation (see chapter **4 Mounting** on page 37).

The following list gives an overview of the typical installation steps:

- Connect ICR890 and/or CLV490 system to supply voltage OUT
- Connect ICR890 and/or CLV490 system to MSC800 via CAN bus
- Connect MLG light grid (RS-485) or VMS4xx/5xx (CAN bus)
- Connect read cycle sensor(s)
- Connecting the incremental encoder
- Optional: wire switching outputs for system status display
- Connect host computer (RS-232, RS-422/485, Ethernet, or PROFIBUS-DP)
- Temporarily connect PC/laptop for commissioning and configuration (RS-232, Ethernet, or USB)
- Connect mains voltage IN.

The actual work to be carried out depends on the relevant configuration in which the MSC800 is used (see chapter **5.2 Electrical installation of the MSC800** on page 44).

After completion of the electrical installation, commissioning and configuration of the MSC800 is carried out (see chapter **6.1 Overview of the commissioning steps** on page 73).

5.2 Electrical installation of the MSC800

The MSC800 is used in combination with ID sensors for single-side or multi-side reading.

This chapter provides a schematic description of these application possibilities with a block circuit diagram and a wiring table. The terminals for the DC 24 V supply voltage and the connections on the logic unit of the MSC800 are described in chapter **5.3 Electrical connections** on page 45. Instructions on carrying out the individual installation steps are provided in chapter **5.4 Performing the electrical installation** on page 56.

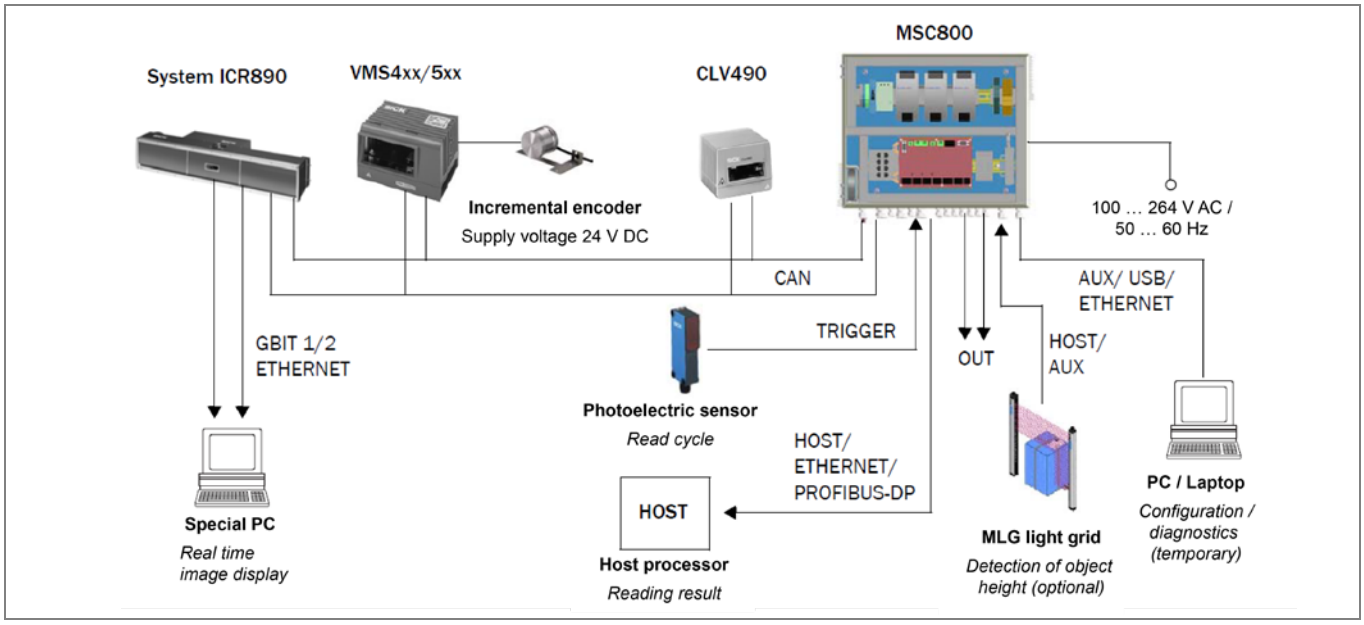


Fig. 16: Block circuit diagram: connection principle for an MSC800

Wiring of the MSC800

The following connections must be produced on the MSC800:

No.	Connection to the MSC800	Function	Connection with …	Cable to be used
1	Terminal block -X100	Supply voltage of the MSC800	Mains voltage AC 100 … 264 V/ 50 … 60 Hz	Customer cable
2	Terminal blocks	Supply voltage for ICR890, CLV490, and VMS4xx/5xx	ICR890 system (POWER IN connection)/ corresponding wires of the CAN cable	(ICR890 scope of delivery)
3	CAN	Communication with sensors	External sensors	(ICR890 scope of delivery)
4	TRIGGER	Read cycle trigger signals	External read cycle sensor	(ICR890 scope of delivery)
5	HOST *or* ETHERNET or PROFIBUS	Data output of the reading result	Host computer (RS-232, RS-422/485, or Ethernet)	Customer cable
6	OUT	Signaling system status	PLC (optional)	Customer cable
7	AUX *or* USB *or* ETHERNET	Configuration/diagnostics	Temporary with standard PC	Customer cable

Tab. 10 MSC800: overview of connections to be made on the MSC800

5.3 Electrical connections

NOTE

Radio interference may occur when used in residential areas

The MSC800 must be used exclusively in industrial environments.

5.3.1 Terminals for mains voltage IN and supply voltage OUT

MSC800-1100

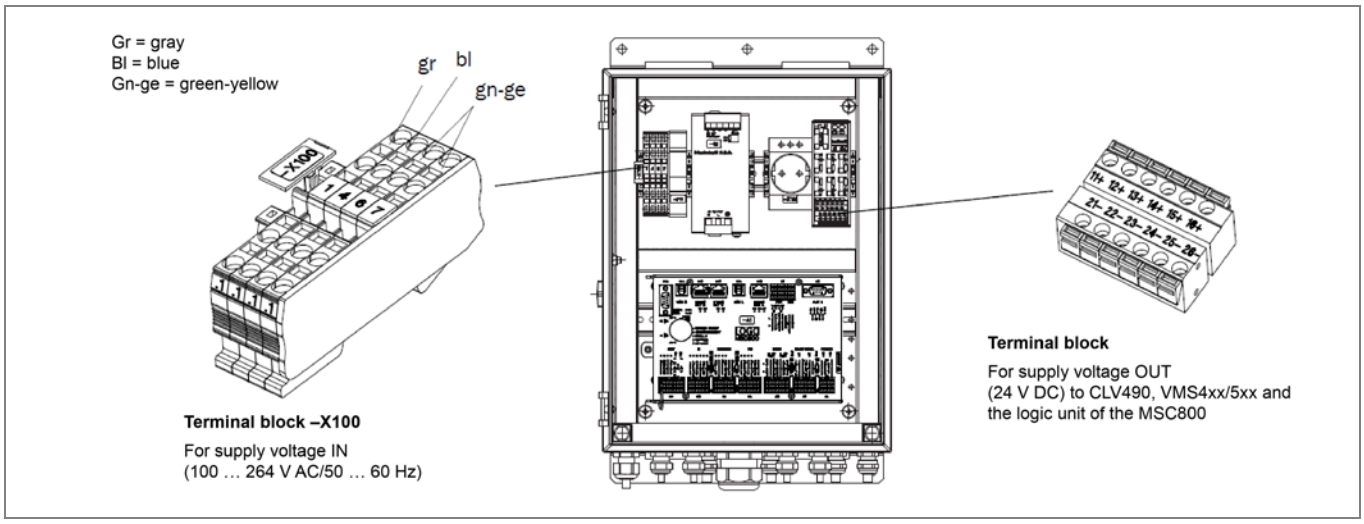


Fig. 17: Terminals on the MSC800-1100 for mains voltage IN and supply voltage OUT

Connections for mains voltage IN on the MSC800-1100

Terminal	Color	Signal	Function
-X100/1.**1**	Gray	L	Mains voltage AC 100 … 264 V / 50 … 60 Hz (phase)
-X100/1.**4**	Blue	N	Mains voltage AC 100 … 264 V / 50 … 60 Hz (neutral conductor)
-X100/1.**6**	Green-yellow	PE	Protective conductor
-X100/1.**7**	Green-yellow	PE	

Tab. 11: MSC800-1100: -X100 terminal block pin assignment for mains voltage IN

Connections for supply voltage OUT

Terminal	Signal	Function	Protected by fuse
11+	DC +24 V	Supply voltage OUT	F1 (4 A, slow-acting)
12+	DC +24 V	Supply voltage OUT	F2 (4 A, slow-acting)
13+	DC +24 V	Supply voltage OUT	F3 (4 A, slow-acting)
14+	DC +24 V	Supply voltage OUT	F4 (4 A, slow-acting)
15+	DC +24 V	Supply voltage OUT	F5 (4 A, slow-acting)
16+	DC +24 V	Supply voltage OUT	F6 (2 A, slow-acting)
21–/22–/23–/ 24–/25–/26–	GND	Ground	

Tab. 12 MSC800-1100: assignment of the 12-pin terminal block for supply voltage OUT on CLV490, VMS4xx/5xx, and logic unit of the MSC800

MSC800-2100

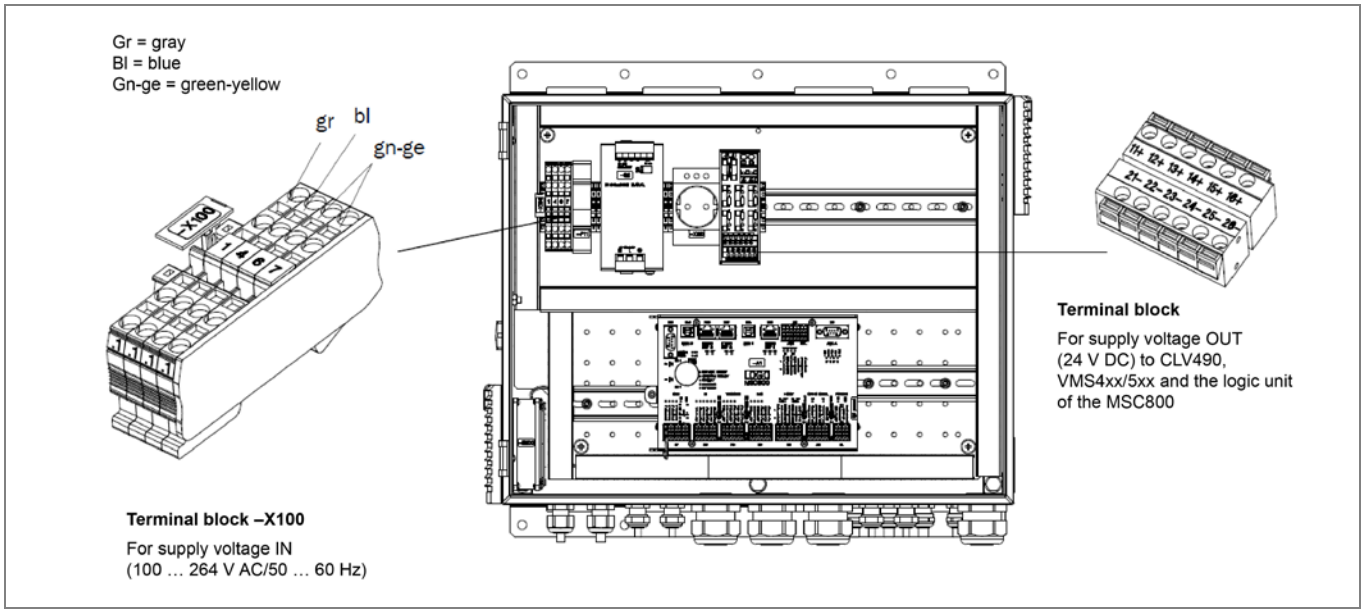


Fig. 18: Terminals on the MSC800-2100 for mains voltage IN and supply voltage OUT

Connections for mains voltage IN on the MSC800-2100

Terminal	Color	Signal	Function
-X100/1.**1**	Gray	L	Mains voltage AC 100 … 264 V / 50 … 60 Hz (phase)
-X100/1.**4**	Blue	N	Mains voltage AC 100 … 264 V / 50 … 60 Hz (neutral conductor)
-X100/1.**6**	Green-yellow	PE	Protective conductor
-X100/1.**7**	Green-yellow	PE	

Tab. 13: MSC800-2100: -X100 terminal block pin assignment for mains voltage IN

Connections for supply voltage OUT

Terminal	Signal	Function	Protected by fuse
11+	DC +24 V	Supply voltage OUT	F1 (4 A, slow-acting)
12+	DC +24 V	Supply voltage OUT	F2 (4 A, slow-acting)
13+	DC +24 V	Supply voltage OUT	F3 (4 A, slow-acting)
14+	DC +24 V	Supply voltage OUT	F4 (4 A, slow-acting)
15+	DC +24 V	Supply voltage OUT	F5 (4 A, slow-acting)
16+	DC +24 V	Supply voltage OUT	F6 (2 A, slow-acting)
21–/22–/23–/ 24–/25–/26–	GND	Ground	

Tab. 14 MSC800-2100: assignment of the 12-pin terminal block for supply voltage OUT on CLV490, VMS4xx/5xx, and logic unit of the MSC800

MSC800-2300

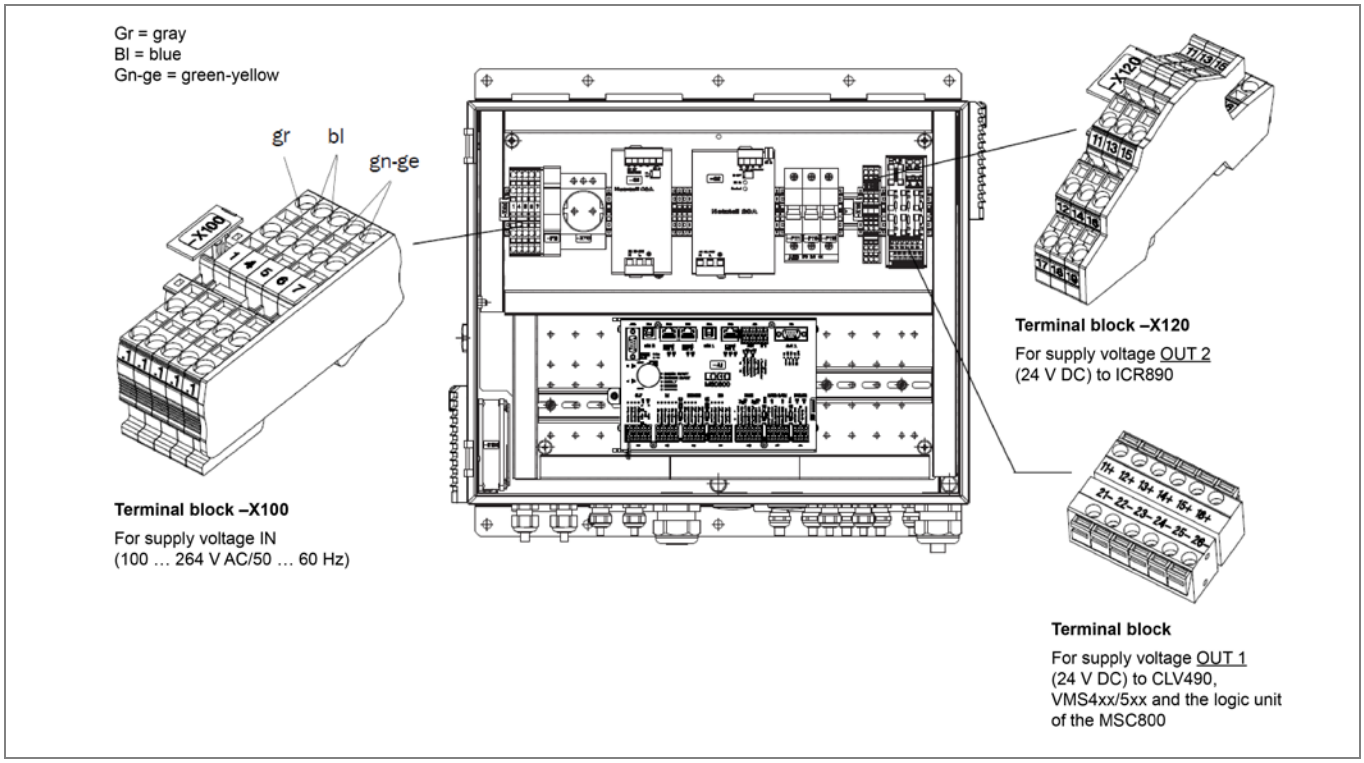


Fig. 19: Terminals on the MSC800-2300 for mains voltage IN and supply voltage OUT

Connections for mains voltage IN on the MSC800-2300

Terminal	Color	Signal	Function
-X100/1.**1**	Gray	L	Mains voltage AC 100 … 264 V / 50 … 60 Hz (phase)
-X100/1.**4**	Blue	N	Mains voltage AC 100 … 264 V / 50 … 60 Hz (neutral conductor)
-X100/1.**5**	Blue	N	
-X100/1.**6**	Green-yellow	PE	Protective conductor
-X100/1.**7**	Green-yellow	PE	

Tab. 15: MSC800-2300: -X100 terminal block pin assignment for mains voltage IN

Connections for supply voltage OUT 2 on the MSC800-2300 for ICR890

Terminal	Signal	Function	Protected by the automatic circuit breakers
-X120/**11**	DC +24 V	Supply voltage OUT 2 (power supply unit module 2)	–F111
-X120/**13**	DC +24 V		–F113
-X120/**15**	DC +24 V		–F115
-X120/**12**	GND	Ground (power supply unit module 2)	–
-X120/**14**	GND		
-X120/**16**	GND		
-X120/**17**	Shield	Shield	-
-X120/**18**	Shield		
-X120/**19**	Shield		

Tab. 16 MSC800-2300: assignment of the -X120 terminal block for supply voltage OUT 2 on ICR890

Connections for supply voltage OUT 1 on the MSC800-2300 for CLV490, VMS4xx/5xx, and logic unit of the MSC800

Terminal	Signal	Function	Protected by fuse
11+	DC +24 V	Supply voltage OUT	F1 (4 A, slow-acting)
12+	DC +24 V	Supply voltage OUT	F2 (4 A, slow-acting)
13+	DC +24 V	Supply voltage OUT	F3 (4 A, slow-acting)
14+	DC +24 V	Supply voltage OUT	F4 (4 A, slow-acting)
15+	DC +24 V	Supply voltage OUT	F5 (4 A, slow-acting)
16+	DC +24 V	Supply voltage OUT	F6 (2 A, slow-acting)
21–/22–/23–/ 24–/25–/26–	GND	Ground	

Tab. 17 MSC800-2300: assignment of the 12-pin terminal block for supply voltage OUT on CLV490, VMS4xx/5xx, and logic unit of the MSC800

MSC800-3400

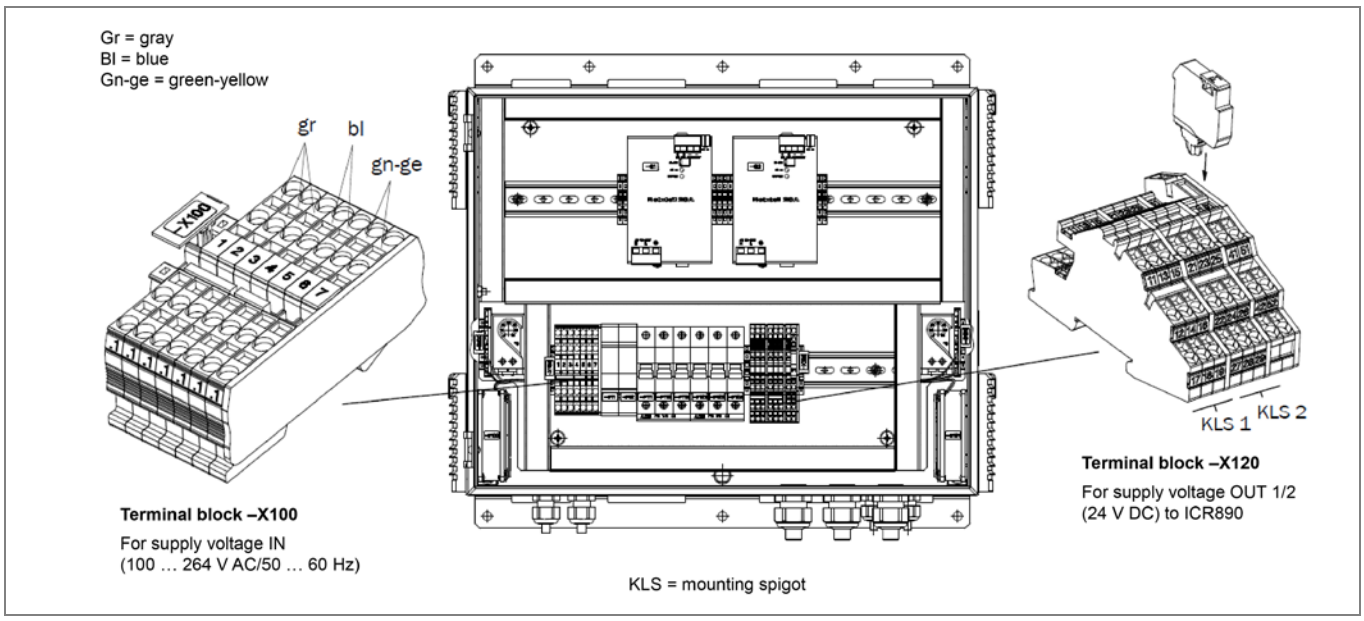


Fig. 20: Terminals on the MSC800-3400 for mains voltage IN and supply voltage OUT

Connections for mains voltage IN on the MSC800-3400

Terminal	Color	Signal	Function
-X100/1.**1**	Gray	L	Mains voltage AC 100 … 264 V / 50 … 60 Hz (phase)*
-X100/1.**2**	Gray	L	
-X100/1.**3**	Gray	L	
-X100/1.**4**	Blue	N	Mains voltage AC 100 … 264 V / 50 … 60 Hz (neutral conductor)
-X100/1.**5**	Blue	N	
-X100/1.**6**	Green-yellow	PE	Protective conductor
-X100/1.**7**	Green-yellow	PE	
* After removing the bridge between the gray terminals, the assignment also has three different phases			

Tab. 18: MSC800-3400: -X100 terminal block pin assignment for mains voltage IN

Connections for supply voltage OUT 1 and OUT 2 on the MSC800-3400

Terminal set	Terminal	Signal	Function	Protected by the automatic circuit breakers
KLS1	-X120/**11**	DC +24 V	Supply voltage OUT 1 (power supply unit modules 1)	–F111
	-X120/**13**	DC +24 V		–F113
	-X120/**15**	DC +24 V		–F115
	-X120/**12**	GND	Ground 1	–
	-X120/**14**	GND		
	-X120/**16**	GND		
	-X120/**17**	Shield	Shield	–
	-X120/**18**	Shield		
	-X120/**19**	Shield		

Tab. 19 MSC800-3400: assignment of the -X120 terminal block, part 1 for supply voltage OUT 1 on ICR890 (system 1)

KLS2	-X120/**21**	DC +24 V	Supply voltage OUT 2 (power supply unit modules 2)	–F121 –F123 –F125
	-X120/**23**	DC +24 V		
	-X120/**25**	DC +24 V		
	-X120/**22**	GND	Ground 2	
	-X120/**24**	GND		
	-X120/**26**	GND		
	-X120/**27**	Shield	Shield	–
	-X120/**28**	Shield		
	-X120/**29**	Shield		

Tab. 20 MSC800-3400: assignment of the -X120 terminal block, part 2 for supply voltage OUT 2 on ICR890 (system 2)

Terminal	Signal	Function	Protected by fuse
-X120/**41**	+	Measuring point thermal circuit breaker 1 (red)[1)]	–
-X120/**42**	–	Measuring point thermal circuit breaker 1 (red)[1)]	–
-X120/**51**	DC +24 V	Supply voltage OUT 1 (power supply unit module 1, tap before circuit breaker F111/113/115) on thermal circuit breaker 2 (blue)/fan 1 and 2	F1 (4 A, slow-acting)
-X120/**52**	GND	Ground	–

[1)] Thermal circuit breaker, left in the MSC800-3400 (see **MSC800-3400 device** view on page 22), switch opens at T_U = 57.5 °C.

By setting up a closed circuit (DC +24 V on terminal -X120/41; GND on terminal -X120/42) and using appropriate assessment, e.g., by the logic unit of an MSC800, it is possible to signal overheating of the cabinet. It is also possible to use series connection of the same thermal circuit breaker to MSC800 cabinets of the same type.

[2)] Thermal circuit breaker, right in the MSC800-3400 (see **MSC800-3400 device** view on page 22), switch closes at T_U = 37.5 °C and switches the two fans on/off.

Tab. 21 MSC800-3400: assignment of the -X120 terminal block, part 3 for supply voltage OUT 1 on thermal circuit breaker/fan

MSC800-3600

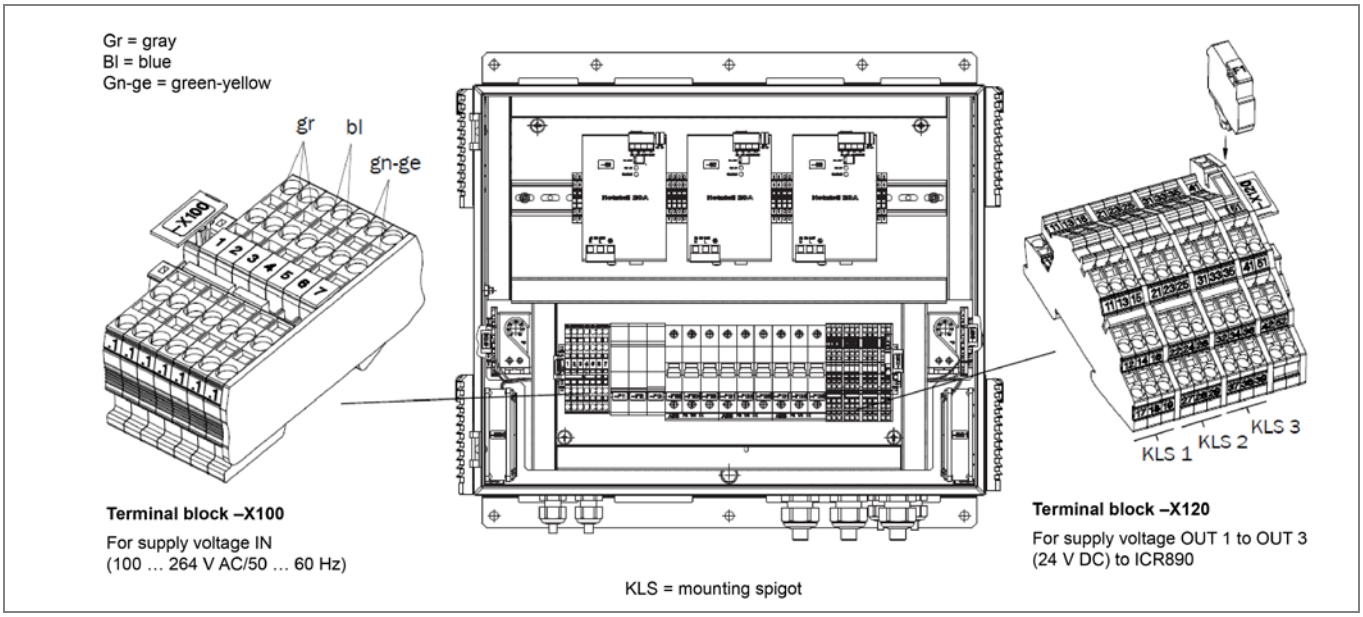


Fig. 21: Terminals on the MSC800-3600 for mains voltage IN and supply voltage OUT

Connections for mains voltage IN on the MSC800-3600

Terminal	Color	Signal	Function
-X100/1.1	Gray	L	Mains voltage AC 100 … 264 V / 50 … 60 Hz (phase)*
-X100/1.2	Gray	L	
-X100/1.3	Gray	L	
-X100/1.4	Blue	N	Mains voltage AC 100 … 264 V / 50 … 60 Hz (neutral conductor)
-X100/1.5	Blue	N	
-X100/1.6	Green-yellow	PE	Protective conductor
-X100/1.7	Green-yellow	PE	
* After removing the bridge between the gray terminals, the assignment also has three different phases			

Tab. 22: MSC800-3600: -X100 terminal block pin assignment for mains voltage IN

Connections for supply voltage OUT 1 … OUT 3 on the MSC800-3600

Terminal set	Terminal	Signal	Function	Protected by the automatic circuit breakers
KLS1	-X120/**11**	DC +24 V	Supply voltage OUT 1 (power supply unit modules 1)	–F111
	-X120/**13**	DC +24 V		–F113
	-X120/**15**	DC +24 V		–F115
	-X120/**12**	GND	Ground 1	–
	-X120/**14**	GND		
	-X120/**16**	GND		
	-X120/**17**	Shield	Shield	–
	-X120/**18**	Shield		
	-X120/**19**	Shield		

Tab. 23 MSC800-3600: assignment of the -X120 terminal block, part 1 for supply voltage OUT 1 on ICR890 (system 1)

KLS2	-X120/**21**	DC +24 V	Supply voltage OUT 2 (power supply unit modules 2)	–F121 –F123 –F125
	-X120/**23**	DC +24 V		
	-X120/**25**	DC +24 V		
	-X120/**22**	GND	Ground 2	
	-X120/**24**	GND		
	-X120/**26**	GND		
	-X120/**27**	Shield	Shield	–
	-X120/**28**	Shield		
	-X120/**29**	Shield		

Tab. 24 MSC800-3600: assignment of the -X120 terminal block, part 2 for supply voltage OUT 2 on ICR890 (system 2)

Terminal set	**Terminal**	**Signal**	**Function**	**Protected by the automatic circuit breakers**
KLS3	-X120/**31**	DC +24 V	Supply voltage OUT 3 (power supply unit modules 3)	–F131
	-X120/**33**	DC +24 V		–F133
	-X120/**35**	DC +24 V		–F135
	-X120/**32**	GND	Ground 3	–
	-X120/**34**	GND		
	-X120/**36**	GND		
	-X120/**37**	Shield	Shield	–
	-X120/**38**	Shield		
	-X120/**39**	Shield		

Tab. 25 MSC800-3600: assignment of the -X120 terminal block, part 3 for supply voltage OUT 3 on ICR890 (system 3)

Terminal	**Signal**	**Function**	**Protected by fuse**
-X120/**41**	+	Measuring point thermal circuit breaker 1 (red)[1)]	–
-X120/**42**	–	Measuring point thermal circuit breaker 1 (red)[1)]	–
-X120/**51**	DC +24 V	Supply voltage OUT 1 (power supply unit module 1, tap before circuit breaker F111/113/115) on thermal circuit breaker 2 (blue)/fan 1 and 2	F1 (4 A, slow-acting)
-X120/**52**	GND	Ground	–

[1)] Thermal circuit breaker, left in the MSC800-3600 (see **MSC800-3600 device** view on page 23), switch opens at T_U = 57.5 °C.

By setting up a closed circuit (DC +24 V on terminal -X120/41; GND on terminal -X120/42) and using appropriate assessment, e.g., by the logic unit of an MSC800, it is possible to signal overheating of the cabinet. It is also possible to use series connection of the same thermal circuit breaker to MSC800 cabinets of the same type.

[2)] Thermal circuit breaker, right in the MSC800-3600 (see **MSC800-3600 device view** on page 23), switch closes at T_U = 37.5 °C and switches the two fans on/off.

Tab. 26 MSC800-3600: assignment of the -X120 terminal block, part 4 for supply voltage OUT 1 on thermal circuit breaker/fan

5.3.2 Electrical connections on the MSC800-0000 logic unit (overview)

Fig. 22: MSC800-0000 logic unit in the cabinet of the MSC800-1100/-2100/-2300: position of the electrical connections

The following interfaces are carried via the logic unit connections:

Code	Connection	Design	Pole number	Function
X15	PROFIBUS	D-Sub	9, female connector	Main data interface
X14	USB 2	USB	4, female connector	Auxiliary data interface (only for SICK service)
X13	ETHERNET 3	RJ-45	8, female connector	Auxiliary data interface
X12	ETHERNET 2	RJ-45	8, female connector	Auxiliary data interface
X11	USB 1	USB	4, female connector	Auxiliary data interface
X10	ETHERNET 1	RJ-45	8, female connector	Main data interface
X9	AUX (1/2)	Block	10, terminals	Auxiliary data interface (RS-232, RS-422/485)
X9	INT	Block	4, terminals	(only for SICK service)
X8	AUX 1	D-Sub	9, male connector	Auxiliary data interface (RS-232)
X7	OUT	Block	8, terminals	4 digital switching outputs (system status)
X7	OUT	Block	6, terminals	2 relay outputs (system status)
X6	IN	Block	12, terminals	6 digital switching inputs
X5	TRIGGER	Block	12, terminals	4 digital switching inputs (read cycle)
X4	INC	Block	12, terminals	4 digital switching inputs (incremental encoder)
X3	HOST (1/2)	Block	14, terminals	Main data interface (RS-232, RS-422/485)
X2	CAN 2	Block	6, terminals	Input/output CAN SENSOR network 2
X2	CAN 1	Block	6, terminals	Input/output CAN SENSOR network 1
X1	POWER (1/2)	Block	8, terminals	Input supply voltage DC 24 V (from the power supply unit module)

Tab. 27 MSC800-0000: function of the electrical connections (overview)

Comments on the connections of the MSC800-0000 logic unit

Connection	Note
PROFIBUS	Design as per EN 50170.
USB 2	B type, USB1.1-compatible.
ETHERNET	10/100 Mbit/s
USB 1	B type, USB2.0-compatible.
AUX (1/2)	Two independent data interfaces. Can each be used as RS-232 or RS-422/485 design. The RS-422/485 design is not terminable in the MSC800.
AUX 1	For service purposes.
OUT	4 digital switching outputs, high-side switch. 2 relay outputs, changeover contact for switching protective extra-low voltage
IN	6 digital switching inputs, opto-decoupled. 3 x DC 24 V for supply of external sensors. With switch S6-1/-2, isolated SGND of the inputs on GND of the MSC800 can be switched.
TRIGGER	4 digital switching inputs, opto-decoupled. TRIG _1 and TRIG_2 are available redundantly. 3 x DC 24 V for supply of external sensors. With switch S5, isolated SGND of the inputs on GND of the MSC800 can be switched.
INC	4 digital switching inputs, opto-decoupled. All switching inputs are available redundantly. 2 x DC 24 V for supply of external sensors. With switch S4, isolated SGND of the inputs on GND of the MSC800 can be switched.
HOST (1/2)	Two independent data interfaces. Can each be used as RS-232 or RS-422/485 design. Terminals for HOST 1 are redundantly available (red 1 to red 4). Data GND isolated from GND of the MSC800 (GND_13). The RS-422/485 design is not terminable in the MSC800 with command string.
CAN2 / CAN1	Two independent bus node points. Redundant terminals for each bus node. CAN2 galvanically isolated from the MSC800 via digital isolator component, has GND terminals isolated from GND (GND_12). Termination with double DIP switch S22 and S21.
Power (1/2)	Two redundant, independent supply inputs.

Tab. 28 MSC800-0000: comments on connections X15 to X1

Important Further technical information (electrical values, etc.) on the connections can be found from chapter **5.4.8** on page 64 to chapter **5.4.12** on page 69.

Delivery status of DIP switch on the MSC800-0000 logic unit

Switch	Designation	Function	Position
S6-2[1)]	SGND_6 – GND	ON: switches SGND of all inputs IN to GND of the MSC800 OFF: SGND is insulated from the MSC800	OFF
S6-1[1)]	SGND_6 – GND	As S6-2	OFF
S5	SGND_5 – GND	ON: switches SGND of all inputs TRIGGER to GND of the MSC800 OFF: SGND is insulated from the MSC800	OFF
S4	SGND_4 – GND	ON: switches SGND of all inputs INC to GND of the MSC800 OFF: SGND is insulated from the MSC800	OFF
S22-2[2)]	Term CAN2	ON: terminates the CAN node point CAN2 OFF: no termination	ON
S22-1[2)]	Term CAN2	ON: terminates the CAN node point CAN2 OFF: no termination	ON
S21-2[2)]	Term CAN1	ON: terminates the CAN node point CAN1 OFF: no termination	ON
S21-1[2)]	Term CAN1	ON: terminates the CAN node point CAN1 OFF: no termination	ON
1) If the external sensors are supplied from the MSC800 and SGND is laid on GND, use both switches! 2) Both switches must be used in each case for termination.			

Tab. 29 MSC800-0000: DIP switch of the logic unit in delivery status

5.3.3 Function of the LEDs of the logic unit

See chapter **3.5.2 Function of the LEDs** on page 35.

5.4 Performing the electrical installation

Wiring with power supply disconnected

DANGER

Risk of injury due to electrical current

The MSC800 is connected to the mains voltage (AC 100 ... 264 V / 50 ... 60 Hz).

- Comply with standard safety requirements when working on electrical plants.
- All installation work must be carried out **with the power supply disconnected**.

DANGER

Risk of injury due to electrical current

The mains voltage (AC 100 ... 264 V / 50 ... 60 Hz) is protected by a 1-pin circuit breaker (phase).

If the phase and neutral conductors are swapped when connecting to the -X120 terminal block, there is a risk of electrocution if you touch the respective contacts, even after the input current circuit has been switched off with the -F12 circuit breaker.

- Carefully connect the mains voltage to the -X100 terminal block.
- Verify that the mains voltage is connected correctly before the mains switch is used to switch on the customer's power.

Important

To ensure the cables are securely attached and in compliance with the IP 54/IP 65 enclosure rating, the coupling nuts for strain relief on the cabinet of the MSC800 must be tightened.

Use of the internal power socket

DANGER

Risk of injury due to electrical current

The socket in the MSC800, against which the supply voltage IN is also applied, is **not** equipped with a residual current protective device (RCD) from the factory.

- The socket can only be used by **qualified electricians for service purposes**, e.g., to connect a laptop. If necessary, insert a mobile plug-in FI circuit-breaker in the socket according to the safety concept provided by the customer.
- The socket is **not suitable** for connecting work equipment such as drilling equipment, cleaning equipment (e.g., vacuum), etc.
- If necessary, insert an external automated mains voltage isolator (e.g., residual current protective device) for the supply voltage IN of the MSC800 according to the safety concept provided by the customer.

5.4.1 Wire cross-sections

- ➢ Wire all connections provided by the customer using shielded copper conductors.
- ➢ Observe the wire cross-sections required:
- Switching inputs/outputs: at least 0.25 mm^2
- Data interfaces: at least 0.22 mm^2
- Supply voltage: the cable to the MSC800 must be at least 2.5 m from a wire section of 4 mm^2.
- ➢ Lay all of the cables such that there is no risk of people tripping over them and the cables are protected against damage.

5.4.2 Terminal strips

The terminals have the following wire cross-sections:

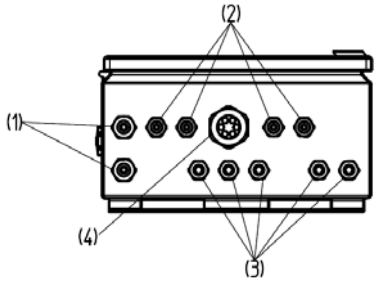
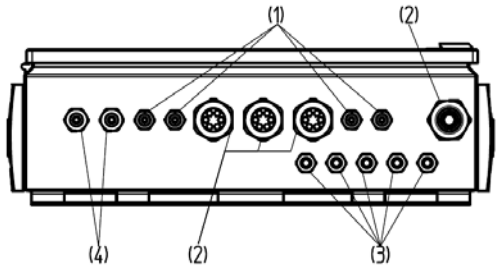
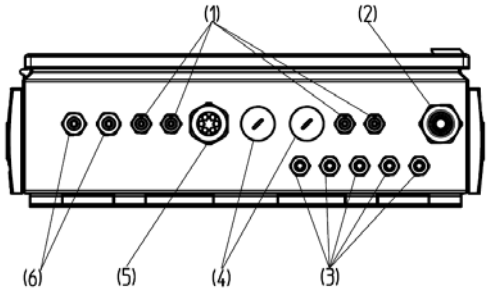
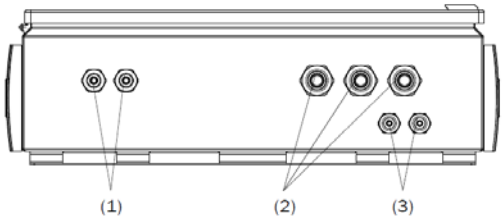
MSC800 type	Spring force terminal block	Function	Cable cross-section	
			Rigid cable	Flexible cable
MSC800-1100 MSC800-2100	-X100	Mains voltage IN	0.08 ... 6 mm^2	0.08 ... 4 mm^2
	12-pin terminal block	Supply voltage OUT	0.2 ... 1.5 mm^2	0.2 ... 1.5 mm^2
	X9, X7 to X1	Logic unit connections	0.2 ... 1.5 mm^2	0.2 ... 1.5 mm^2
MSC800-2300	-X100	Mains voltage IN	0.08 ... 6 mm^2	0.08 ... 4 mm^2
	-X120	Supply voltage OUT	0.08 ... 2.5 mm^2	0.08 ... 2.5 mm^2
	12-pin terminal block	Supply voltage OUT	0.2 ... 1.5 mm^2	0.2 ... 1.5 mm^2
	X9, X7 to X1	Logic unit connections	0.2 ... 1.5 mm^2	0.2 ... 1.5 mm^2
MSC800-3400 MSC800-3600	-X100	Mains voltage IN	0.08 ... 6 mm^2	0.08 ... 4 mm^2
	-X120	Supply voltage OUT	0.08 ... 2.5 mm^2	0.08 ... 2.5 mm^2
	X9, X7 to X1	Logic unit connections	0.2 ... 1.5 mm^2	0.2 ... 1.5 mm^2

Tab. 30 Terminals: applicable wire sections

Important For secure contacting, do not use any wire ferrules when laying the open wire ends of flexible cables to the spring force terminals.

5.4.3 Cable entries

The following cable entries are available on the bottom of the housing:

MSC800 type	View	Cable entry
MSC800-1100		(1): 2 x M screw fitting, plastic, M20 x 1.5 (permitted cable diameter: 6 ... 12 mm) (2): 4 x M screw fitting, metal, M16 x 1.5 (permitted cable diameter: 5.5 ... 10 mm) (3): 5 x M screw fitting, metal, M16 x 1.5 (permitted cable diameter: 3 ... 7 mm) (4): 1 x M screw fitting, plastic, M32 x 1.5 (permitted cable diameter: 6 x 5.5 ... 7 mm)
MSC800-2100		(1): 4 x M screw fittings, metal, M16 x 1.5 (permitted cable diameter: 5.5 ...10 mm) (2): 4 x M screw fitting, plastic, M32 x 1.5 (permitted cable diameter: 6 x 5.5 ... 7 mm) (3): 5 x M screw fittings, metal, M16 x 1.5 (permitted cable diameters: 3 ... 7 mm) (4): 2 x M screw fitting, plastic, M20 x 1.5 (permitted cable diameter: 6 ... 12 mm)
MSC800-2300		(1): 4 x M screw fittings, metal, M16 x 1.5 (permitted cable diameter: 5.5 ...10 mm) (2): 1 x M screw fitting, plastic, M25 x 1.5 (permitted cable diameters: 13...18 mm) (3): 5 x M screw fittings, metal, M16 x 1.5 (permitted cable diameters: 3 ... 7 mm) (4): 2 x M-locking screw, plastic, M32 x 1.5 (5): 1 x M screw fitting, plastic, M32 x 1.5 (permitted cable diameter: 6 x 5.5 ... 7 mm) (6): 2 x M screw fitting, plastic, M20 x 1.5 (permitted cable diameter: 6 ... 12 mm)
MSC800-3400 MSC800-3600		(1): 2 x M screw fitting, plastic, M20 x 1.5 (permitted cable diameter: 6 ... 12 mm) (2): 3 x M screw fitting, metal, M25 x 1.5 (permitted cable diameter: 13 ... 18 mm) (3): 2 x M screw fitting, plastic, M16 x 1.5 (permitted cable diameter: 5 ... 10 mm)

Tab. 31 Cable entries on the MSC800

5.4.4 Applying the shield

In order to connect the cable shield with the housing of the MSC800, proceed as follows:

MSC800 type	View	Cable entry
MSC800-1100 MSC800-2100	24 V DC supply voltage to CLV490/VMS4xx/5xx via the CAN bus cable	On the metal cable entries on the bottom of the housing
	Other cables with shield braid	
MSC800-2300	24 V DC supply voltage to ICR890	Terminal -X120/17 to -X120/19
	24 V DC supply voltage to CLV490/VMS4xx/5xx via the CAN bus cable	On the metal cable entries on the bottom of the housing
	Other cables with shield braid	
MSC800-3400	Supply voltage OUT 1 (DC 24 V) to ICR890 (system 1)	Terminal -X120/17 to -X120/19
	Supply voltage OUT 2 (DC 24 V) to ICR890 (system 2)	Terminal -X120/27 to -X120/29
	24 V DC supply voltage to CLV490/VMS4xx/5xx via the CAN bus cable	On the metal cable entries on the bottom of the housing
	Other cables with shield braid	
MSC800-3600	Supply voltage OUT 1 (DC 24 V) to ICR890 (system 1)	Terminal -X120/17 to -X120/19
	Supply voltage OUT 2 (DC 24 V) to ICR890 (system 2)	Terminal -X120/27 to -X120/29
	Supply voltage OUT 3 (DC 24 V) to ICR890 (system 3)	Terminal -X120/37 to -X120/39
	24 V DC supply voltage to CLV490/VMS4xx/5xx via the CAN bus cable	On the metal cable entries on the bottom of the housing
	Other cables with shield braid	

Tab. 32 Connection of the cable shields on the MSC800

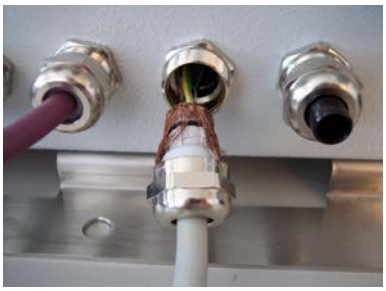


Fig. 23: Connecting the cable shields at the inlet to the housing

Shielded cables must be used for the following connections, and their shielding must be laid on the housing in the cable entry:

- Serial data interfaces (RS-232, RS-422/485)
- Ethernet interface
- CAN interfaces
- Profibus interface
- Digital switching inputs (e.g., incremental encoder, read cycle sensor).

Individual components of the MSC800-0000 logic unit

For electrical connection of the MSC800-0000 logic unit in the event of customer installation into a control cabinet, observe the installation regulations in chapter **4.3.2 Mounting individual components of the logic unit** on page 40.

5.4.5 Circuit breakers and fuses

The MSC800 is equipped with the following circuit breakers and fuses:

MSC800 type	Fuse	Fuse type	Protected circuit	Value/behavior
MSC800-1100 MSC800-2100	-F11	Circuit breaker, 1-pin	Mains voltage AC 100 ... 264 V for mains voltage module -G1 and Schuko plug socket -110X	10 A/trip characteristic B, C, D
	F1 to F6	Fine-wire fuse	Supply voltage OUT	F1 ... F5: 4 A/slow-acting F6: 2 A/slow-acting
MSC800-2300	-F11	Circuit breaker, 1-pin	Mains voltage AC 100 ... 264 V for mains voltage modules -G1, -G2, and -G3, and Schuko plug socket -110X	10 A/trip characteristic B, C, D
	-F111 -F113 -F115	Automatic circuit breaker, each 1-pin	Supply voltage DC 24 V (OUT 2); terminal -X120/11 Terminal -X120/13 Terminal -X120/15	20 A
	F1 to F6	Fine-wire fuse	Supply voltage DC 24 V (OUT 1)	F1 ... F5: 4 A/slow-acting F6: 2 A/slow-acting
MSC800-3400	-F11	Circuit breaker, 1-pin	Mains voltage AC 100 ... 264 V for mains voltage module -G1	10 A/trip characteristic B, C, D
	-F12	Circuit breaker, 1-pin	Mains voltage AC 100 ... 264 V for mains voltage module -G2	10 A/trip characteristic B, C, D
	-F111 -F113 -F115	Automatic circuit breaker, each 1-pin	Supply voltage DC 24 V (OUT 1); Terminal -X120/11 Terminal -X120/13 Terminal -X120/15	10 A
	-F121 -F123 -F125	Automatic circuit breaker, each 1-pin	Supply voltage DC 24 V (OUT 2); Terminal -X120/21 Terminal -X120/23 Terminal -X120/25	10 A
	F1	Fine-wire fuse	Supply voltage OUT 1 on thermal circuit breaker 2 /fans 1 and 2	4 A/slow-acting
MSC800-3600	-F11	Circuit breaker, 1-pin	Mains voltage AC 100 ... 264 V for Power supply unit modules -G1 and -G2	10 A/trip characteristic B, C, D
	-F12	Circuit breaker, 1-pin	Mains voltage AC 100 ... 264 V for Power supply unit modules -G3 and -G4	10 A/trip characteristic B, C, D
	-F13	Circuit breaker, 1-pin	Mains voltage AC 100 ... 264 V for Power supply unit modules -G5 and -G6	10 A/trip characteristic B, C, D
	-F111 -F113 -F115	Automatic circuit breaker, each 1-pin	Supply voltage DC 24 V (OUT 1); Terminal -X120/11 Terminal -X120/13 Terminal -X120/15	10 A
	-F121 -F123 -F125	Automatic circuit breaker, each 1-pin	Supply voltage DC 24 V (OUT 2); Terminal -X120/21 Terminal -X120/23 Terminal -X120/25	10 A
	-F131 -F133 -F135	Automatic circuit breaker, each 1-pin	Supply voltage DC 24 V (OUT 3); Terminal -X120/31 Terminal -X120/33 Terminal -X120/35	10 A
	F1	Fine-wire fuse	Supply voltage OUT 1 on thermal circuit breaker 2 / fans 1 and 2	4 A/slow-acting

Tab. 33 Circuit breakers and fuses

5.4.6 24 V DC supply voltage for the ICR890 systems

Requirements for the supply voltage

The typical power consumption of an ICR890 system is 425 W. The power required per system is supplied in the MSC800-2300 by three power supply unit modules, in the MSC800-3400 by two power supply unit modules, and in the MSC800-3600 by three pairs of power supply unit modules.

The following table shows the number of ICR890 systems which can be operated per MSC800.

Variants of the MSC800	Number of ICR890 systems
MSC800-1100/-2100	–
MSC800-2300	1
MSC800-3400	2
MSC800-3600	3

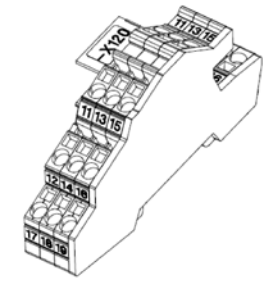
Tab. 34 Number of ICR890 systems per MSC800

Important The wire section for the voltage supply to the ICR890 system must be at least 4 mm^2. In order to ensure the short-circuit/overload protection of the incoming supply cable, the cable must be protected according to the wire sections used (as is done in the MSC800). The following standards must be observed in this case: DIN VDE 0100 (part 430), DIN VDE 0298 (part 4), and/or DIN VDE 0981 (part 1).

Connect supply voltage for the ICR890 systems

1. Make sure that the ext. supply voltage for the MSC800 is switched off.
2. For each system, insert and fix in place the 8-pin Harting HanQ8 female connector of the supply voltage cable no. 2032398 on the ICD890 camera in the 8-pin Harting HanQ8 male connector POWER IN.
3. Lay the free cable end(s) on the terminal block for the supply voltage ICR890 (see the following tables for each MSC800 type)

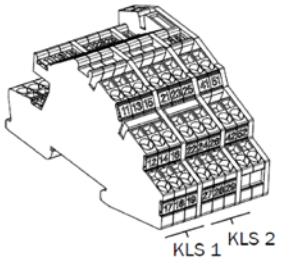
Important The supply voltage remains switched off for further installation work.



Terminal block –X120

Terminal	Signal	Wire color (numbers printed on wires)
-X120/**11**	DC +24 V (ICD890 camera)	Wire 1: black
-X120/**12**	GND (ICD890 camera)	Wire 2: black
-X120/**13**	DC +24 V (ICI890_1#1 illumination)	Wire 3: black
-X120/**14**	GND (ICI890_1#1 illumination)	Wire 4: black
-X120/**15**	DC +24 V (ICI890_1#2 illumination)	Wire 5: black
-X120/**16**	GND (ICI890_1#2 illumination)	Wire 6: black
-X120/**17**	PE	Green-yellow

Tab. 35 MSC800-2300: connection of the supply voltage cable for an ICR890 system

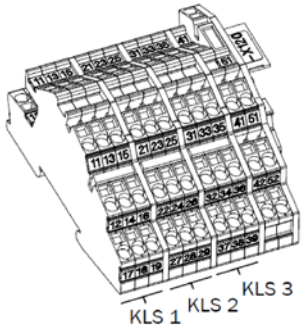


Terminal block –X120

KLS = mounting spigot

System/ terminal set	Terminal	Signal	Wire color (numbers printed on wires)
System 1 KLS1	-X120/**11**	DC +24 V (ICD890 camera)	Wire 1: black
	-X120/**12**	GND (ICD890 camera)	Wire 2: black
	-X120/**13**	DC +24 V (ICI890_1#1 illumination)	Wire 3: black
	-X120/**14**	GND (ICI890_1#1 illumination)	Wire 4: black
	-X120/**15**	DC +24 V (ICI890_1#2 illumination)	Wire 5: black
	-X120/**16**	GND (ICI890_1#2 illumination)	Wire 6: black
	-X120/**17**	PE	Green-yellow
System 2 KLS2	-X120/**21**	DC +24 V (ICD890 camera)	Wire 1: black
	-X120/**22**	GND (ICD890 camera)	Wire 2: black
	-X120/**23**	DC +24 V (ICI890_2#1 illumination)	Wire 3: black
	-X120/**24**	GND (ICI890_2#1 illumination)	Wire 4: black
	-X120/**25**	DC +24 V (ICI890_2#2 illumination)	Wire 5: black
	-X120/**26**	GND (ICI890_2#2 illumination)	Wire 6: black
	-X120/**27**	PE	Green-yellow

Tab. 36 MSC800-3400: connection of the supply voltage cables for two ICR890 systems



Terminal block –X120

KLS = mounting spigotA

System/ terminal set	Terminal	Signal	Wire color (numbers printed on wires)
System 1 KLS1	-X120/**11**	DC +24 V (ICD890 camera)	Wire 1: black
	-X120/**12**	GND (ICD890 camera)	Wire 2: black
	-X120/**13**	DC +24 V (ICI890_1#1 illumination)	Wire 3: black
	-X120/**14**	GND (ICI890_1#1 illumination)	Wire 4: black
	-X120/**15**	DC +24 V (ICI890_1#2 illumination)	Wire 5: black
	-X120/**16**	GND (ICI890_1#2 illumination)	Wire 6: black
	-X120/**17**	PE	Green-yellow
System 2 KLS2	-X120/**21**	DC +24 V (ICD890 camera)	Wire 1: black
	-X120/**22**	GND (ICD890 camera)	Wire 2: black
	-X120/**23**	DC +24 V (ICI890_2#1 illumination)	Wire 3: black
	-X120/**24**	GND (ICI890_2#1 illumination)	Wire 4: black
	-X120/**25**	DC +24 V (ICI890_2#2 illumination)	Wire 5: black
	-X120/**26**	GND (ICI890_2#2 illumination)	Wire 6: black
	-X120/**27**	PE	Green-yellow
System 3 KLS3	-X120/**31**	DC +24 V (ICD890 camera)	Wire 1: black
	-X120/**32**	GND (ICD890 camera)	Wire 2: black
	-X120/**33**	DC +24 V (ICI890_3#1 illumination)	Wire 3: black
	-X120/**34**	GND (ICI890_3#1 illumination)	Wire 4: black
	-X120/**35**	DC +24 V (ICI890_3#2 illumination)	Wire 5: black
	-X120/**36**	GND (ICI890_3#2 illumination)	Wire 6: black
	-X120/**37**	PE	Green-yellow

Tab. 37 MSC800-3600: connection of the supply voltage cables for three ICR890 systems

5.4.7 DC 24 V supply voltage for CLV490 and VMS4xx/5xx

Requirements for the supply voltage

The typical power consumption of a CLV490 is 18 W. The power required for max. 14 CLV490 and one VMS4xx/5xx is supplied in the MSC800-1100/2100 by the -G1 power supply unit module and in the MSC800-2300 by the -G2 power supply unit module.

Power is supplied via the relevant wires of the CAN cable, which are applied directly to the terminals for the supply voltage.

Connecting supply voltage for CLV490 and VMS4xx/5xx

1. Make sure that the mains voltage (external supply voltage) for the MSC800 is switched off.
2. Connect CAN cable to the CLV490/VMS4xx/5xx.
3. Lay the free cable ends for the supply voltage on the 12-pin terminal block for the supply voltage CLV490 and VMS4xx/5xx of the MSC800-1100/2100 or MSC800-2300 (see chapter **5.3 Electrical connections** on page 45).

5.4.8 HOST/AUX data interfaces of the logic unit

Framework conditions for the HOST and AUX data interfaces

The HOST data interface (main data interface) and the AUX data interface (auxiliary data interface) of the MSC800 can each be operated as RS-232 or RS-422/485 design and also in parallel via ports on the Ethernet interface. The following table shows the recommended maximum cable lengths depending on the interface design and the data transmission rate.

Interface type	Data transmission list	Distance to the target computer (host)
RS-232	Up to 19.2 kBd 38.4 ... 115.2 kBd	Max. 10 m Max. 3 m
RS-422 [1)]	Max. 38.4 kBd Max. 57.6 kBd Max. 115.2 kBd	Max. 1,200 m Max. 500 m Max. 10 m
Ethernet	10/100 Mbit/s	Max. 100 m
1) With the corresponding cable termination as per specification		

Tab. 38 Maximum lengths of cable between MSC800 and Host

Recommendation

- ➢ Use shielded data cables (twisted pair wires).
- ➢ To prevent interference factors, do not lay data cables over a longer route in parallel with power supply cables and motor cables, e.g., in cable channels.

Wiring HOST/AUX data interface of the logic unit

NOTE

Damage to the interface modules!

If the HOST/AUX data interface modules are wired incorrectly, then electronic components in the MSC800 could get damaged.

- ➢ Wire data interfaces correctly (see figure below).
- ➢ Carefully check the wiring prior to switching on the MSC800.

- Connect data interfaces to the host/PC in an EMC-compliant manner with shielded cable. Observe the maximum length of cable when doing so.
- Wire the RS-232 or RS-422 versions as shown in the following figure. AUX 1 (RS-232) can also alternatively be wired via the 9-pin D-Sub male connector AUX 1.

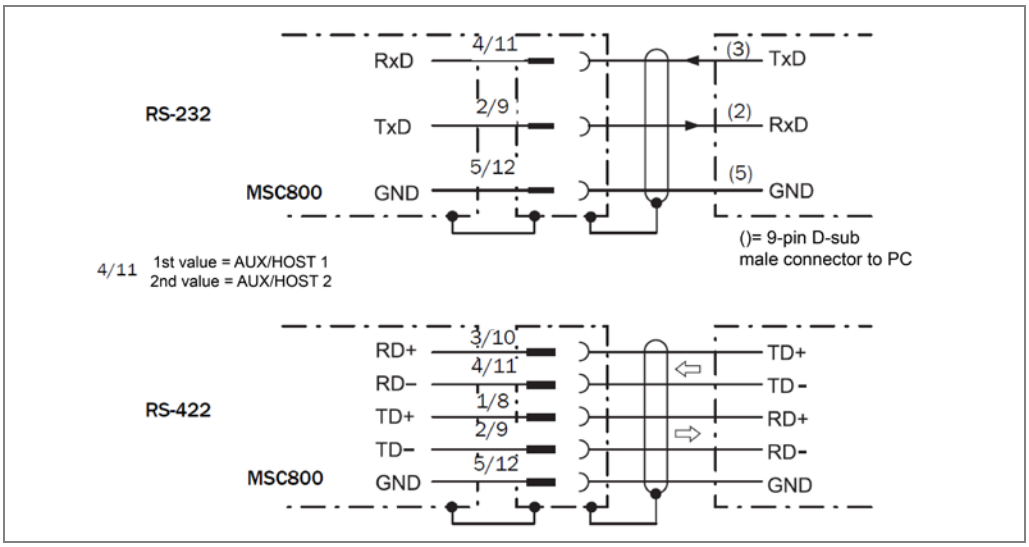


Fig. 24: Wiring of the HOST data interfaces (terminal block X3)/AUX (terminal block X9)

5.4.9 CAN 1/CAN 2 data interface of the logic unit

Framework conditions for the CAN Interface

The SICK-specific CAN-SENSOR network is based on the CAN bus. It is set up in line topology.

The following table shows the maximum permitted length of the CAN bus for the CAN SENSOR network depending on the data transmission rate selected.

Data transmission rate	Maximum data cable length
20 kBit/s	2,476 m
50 kBit/s	976 m
100 kBit/s	576 m
125 kBit/s	476 m
250 kBit/s	226 m
500 kBit/s [1)]	76 m
1) Default in the MSC800.	

Tab. 39 CAN bus: maximum lengths of cable depending on the data transmission rate

The following table shows the maximum permitted total length of all stub cables depending on the data transmission rate. This total length must not be exceeded. Each individual stub cable may be a maximum of 6 m long.

Data transmission rate	Maximum total of all stub cables
125 kBit/s	156 m
250 kBit/s	78 m
500 kBit/s	39 m

Tab. 40 CAN bus: maximum lengths of stub cables depending on the data transmission rate

The required wire cross-section for the data cable depends on the total length of the network. The following table shows the overview as per ISO 11898.

Length of cable	Required wire cross-section (data cable)
0 ... 40 m	≥ 0.25 mm²
40 ... 300 m	≥ 0.34 mm²
300 ... 600 m	≥ 0.5 mm²
600 ... 1,000 m	≥ 0.75 mm²

Tab. 41 CAN bus: required wire cross-section depending on the data cable length

The following table shows the maximum permitted length of the CAN bus depending on the number of CLV490 bar code scanners connected. This total length must not be exceeded.

Number of CLV490	Maximum data cable length
2	70 m
3	50 m
4	36 m
5	28 m
6	24 m
7	20 m
8	18 m
9	16 m
10	14 m
11	13 m
12	12 m

Tab. 42 CAN bus: maximum lengths of cable depending on the number of CLV490

Wiring CAN 1/CAN 2 data interface of the logic unit

All ICR890 systems and other CLV490 bar code scanners and a volume measurement system (VMS4xx/5xx) can be connected via the two CAN interfaces of the MSC800.

The stub cables must be terminated with a resistor on the last device in each case.

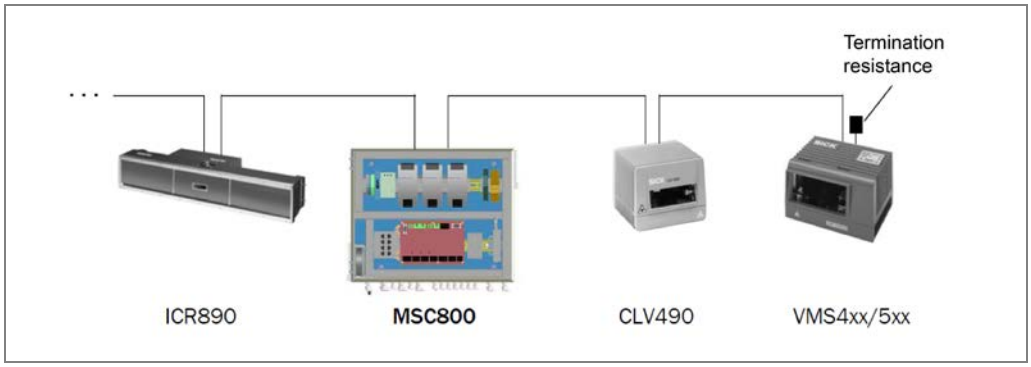


Fig. 25: Wiring of the CAN interface with termination resistor

The division of the devices between the two data interfaces, CAN 1 and CAN 2, and the sequence of the devices depend on the project-specific number and position of the devices.

Example for wiring of the CAN 1 data interface with an ICR890 system:

- ➢ Connect ICR890 system via CAN 1-IN connection with cable no. 6021166 with 5-pin M12 female connector and open end. (For pin/wire color assignment, see chapter **5.5.2 Assignment of wire colors of assembled cables with open end** on page 72.)
- ➢ Place the free wire end in the MSC800 on the CAN 1 connection.
- ➢ Attach termination resistor no. 6021167 to the CAN 1-OUT connection of the ICR890 system.

The signals for read cycle and increment are transmitted to the ICR890 system via the CAN bus. The HOST and AUX data interfaces of the ICR890 system and the signals of the two switching outputs are accessible via the CAN bus on the MSC800. For this purpose, the MSC800 and the ICR890 systems must be configured as master/slave accordingly (see chapter **6.3 Initial commissioning** on page 75).

5.4.10 ETHERNET 1 Ethernet interface of the logic unit

The ETHERNET 1 Ethernet interface of the MSC800 has several functions:

- Output of the read result of the HOST data interface via TCP/IP in parallel to the serial RS-232, RS-422/485 interface design
- Output of the data from the AUX data interface (reading result + reading diagnostic data) via TCP/IP in parallel to the serial RS-232, RS-422/485 interface design
- Access to the MSC800 with the SOPAS-ET configuration software
- Connection as RDT400 client (system remote monitoring).

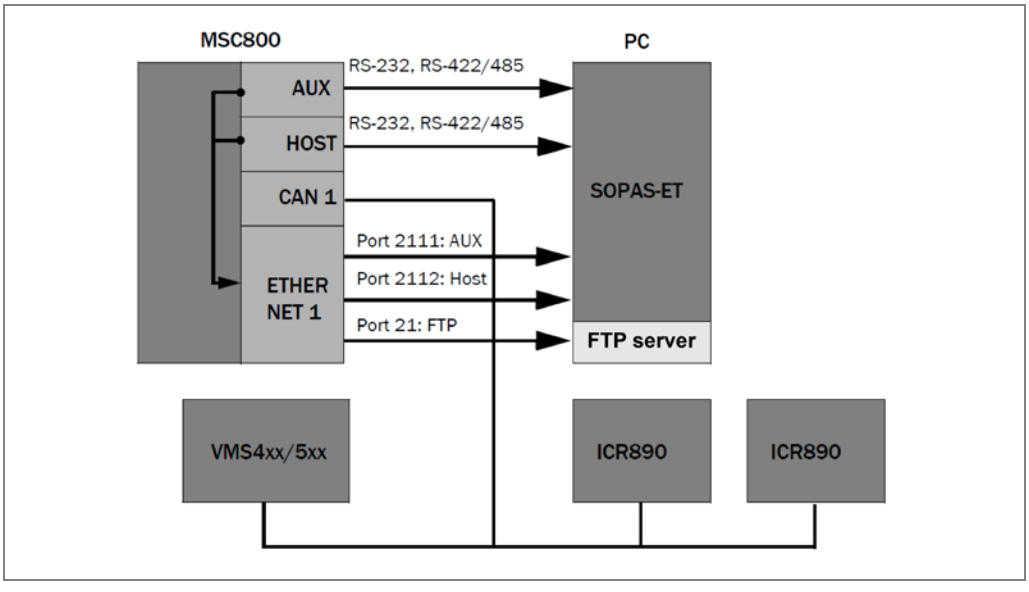


Fig. 26: Block circuit diagram: function of the Ethernet interface

Connecting ETHERNET 1 Ethernet interface of the logic unit

- Use the cross-over cable (see chapter **10.3.2 Accessories: pre-wired cables for CAN SENSOR Network** on page 120) to connect the MSC800 directly to the Ethernet card of the PC (point-to-point connection).

- or -

- Use the standardized data cable (patch cable) to connect the MSC800 to the Ethernet network.

For the settings required on the PC and on the MSC800, see chapter **6.3.2 Establishing communication with the MSC800** on page 76.

5.4.11 IN, TRIGGER, and INC switching inputs of the logic unit

The connection of the read cycle sensor is carried out via one of the digital switching inputs TRIGGER_1 to TRIGGER_4. The incremental encoder is connected to one of the digital switching inputs INC 1 to INC 4 (maximum switching frequency 30 KHz).

The following figure shows an example of the wiring of switching input TRIGGER_1.

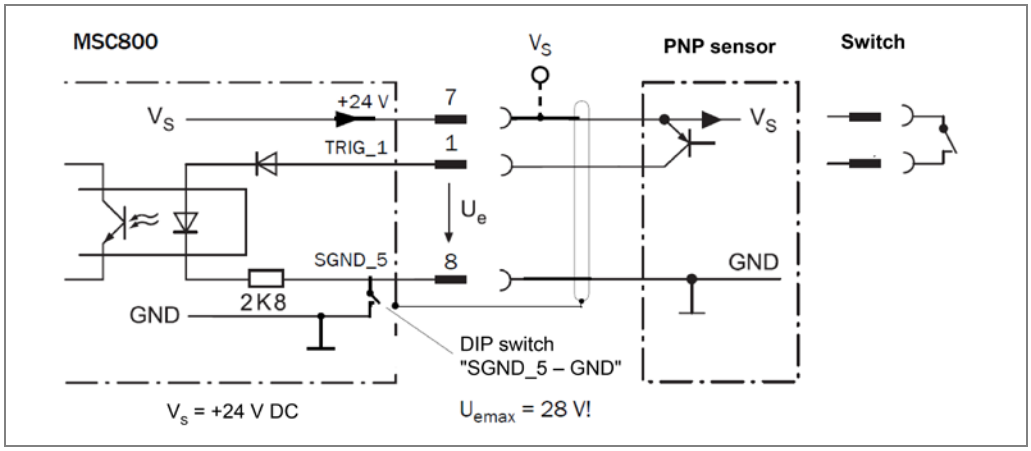


Fig. 27: Wiring of switching input TRIGGER_1

If the read cycle sensor is supplied with an external voltage, the connection of the switching output to the MSC800 can take place volt-free (DIP switch **SGND_5–GND** to **OFF**, connection to terminal 7 is not present).

The table below contains the characteristic data for the input.

Switching behavior	TRIGGER_1: current at the input starts the reading interval, if function is assigned via SOPAS-ET configuration software (Default: not inverted (active high); debouncing: 10 ms; delay cycle start: 0 ms/0 mm, PSDI end: 0 ms/0 mm)	
Properties	– Opto-decoupled, reverse-polarity protected – Can be wired with PNP output of a sensor	
Electrical values	Low: $-1\ V \leq U_e \leq +1\ V$ $-0.3\ mA \leq I_e \leq +0.3\ mA$	High $+8\ V \leq \lvert U_e \rvert \leq +28\ V$ $+1.4\ mA \leq \lvert I_e \rvert \leq +18\ mA$

Tab. 43 Characteristic data for switching input TRIGGER_1

The characteristic data (properties, electrical values) of switching inputs TRIGGER_2 to _4, INC_2 to INC_4, and IN_1 to IN_6 are identical to that of TRIGGER_1.

Wiring switching input TRIGGER_1 of the logic unit

1. Connect read cycle sensor (photoelectric sensor) to switching input TRIGGER_1, as shown in the figure above.
2. For the voltage supply via the MSC800 (terminal 7), also establish the SGND_5 connection with GND. In order to do this, set DIP switch “SGND _5 – GND” to “ON”.

Wiring switching input INC_1 of the logic unit

1. Connect incremental encoder to switching input INC_1: switching output to INC_1 (terminal 1), GND to SGND_4 (terminal 8).
2. For the voltage supply via the MSC800 (terminal 7), also establish the SGND_4 connection with GND. In order to do this, switch DIP switch “SGND _4 – GND” to “ON”.

5.4.12 OUT switching outputs of the logic unit

The connection of a suitable visualization device or PLC for the display of the system status is carried out via the digital switching outputs OUT 1 to OUT.

The following figure shows an example of the wiring of switching output OUT_1.

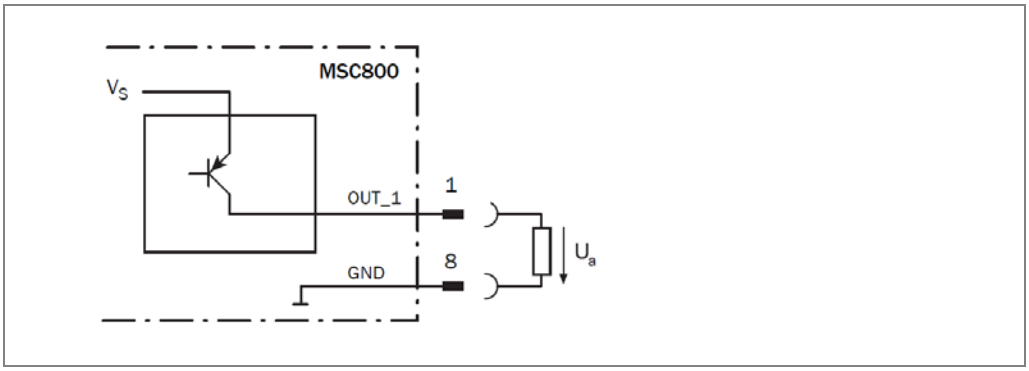


Fig. 28: Wiring of the digital switching output OUT_1 (terminal block X7)

The table below contains the identical characteristic data for the switching outputs.

Switching behavior	PNP switching against the supply voltage SV
Properties	– Short-circuit protected + temperature protected – Not electrically isolated from supply voltage
Electrical values	(VS – 1.5 V) ≤ U_a < V_S at I_a ≤ 100 mA

Tab. 44 Characteristic data of the digital switching outputs OUT_1 to OUT_4

The figure below shows the wiring of relay outputs 1 and 2.

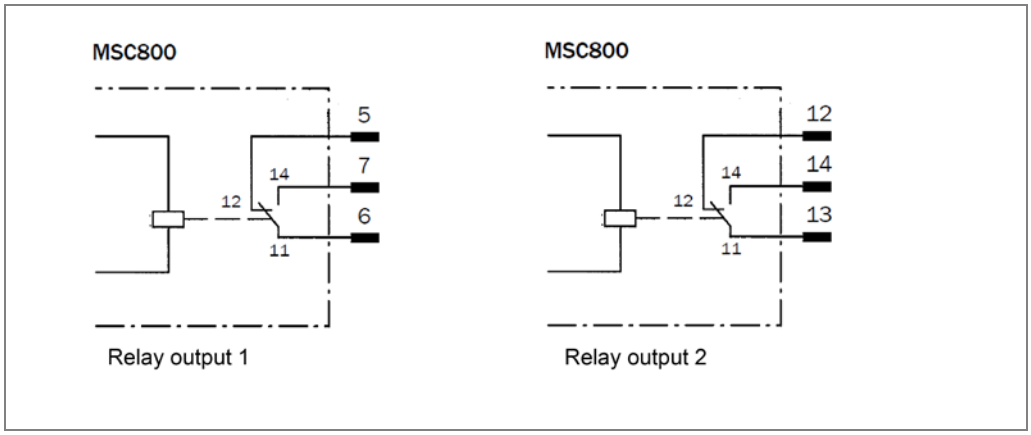


Fig. 29: Wiring of the relay outputs

The table below contains the identical characteristic data for the two relay outputs.

Switching behavior	Changeover switch
Properties	Not short-circuit protected, not temperature protected
Electrical values	$U_{Switch} \leq$ DC 30 V (protective extra-low voltage) $I_{Switch} \leq 1$ A at DC 24 V

Tab. 45 Characteristic data of the relay outputs

Wiring OUT switching outputs of the logic unit

➢ Connect visualization device/PLC to one of the switching outputs OUT 1 to OUT 4, as shown by way of example under **wiring of the digital switching output OUT_1**.

Important

- In the “Device Ready” function, the output provides a static pulse when the MSC800 is ready after initialization.
- In the “System Ready” function, the output provides a static pulse when the entire system of MSC800 and ID sensors is ready.

Recommendation

➢ For the thorough check of the switching functions, use a high resistance digital voltmeter and wire the outputs with a load. This prevents the display of incorrect voltage values/output states.

5.5 Pin assignment of the connections and assignment of the wire color

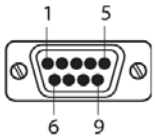
5.5.1 Logic unit connections

“ETHERNET 1”/“ETHERNET 2”/“ETHERNET 3” connections (Ethernet, max. 100 MBit/s)

PIN	Ethernet signal	Function
1	TD+	Sender+
2	TD–	Sender–
3	RD+	Receiver+
4	n. c.	–
5	n. c.	–
6	RD–	Receiver–
7	n. c.	–
8	n. c.	–

Tab. 46 MSC800: pin assignment of the 8-pin RJ-45 female connectors “ETHERNET 1”, “ETHERNET 2”, and “ETHERNET 3”

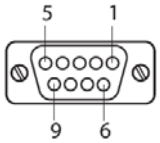
“AUX 1” connection (auxiliary data interface)



PIN	Ethernet signal	Function
1	n. c.	–
2	RxD (RS-232)	Receiver
3	TxD (RS-232)	Sender
4	n. c.	–
5	GND	Ground
6	n. c.	–
7	n. c.	–
8	n. c.	–
9	n. c.	–

Tab. 47 MSC800: pin assignment of the 9-pin D-SUB male connector “AUX 1”

“PROFIBUS” connection

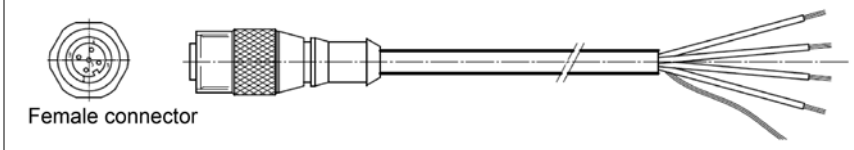


PIN	Signal	Function
1	n. c.	–
2	n. c.	–
3	RxD/TxD (B)	Receive and send data P
4	RTS control	Sender active
5	GND	Ground
6	VCC	+5 V DC
7	n. c.	–
8	RxD/TxD (A)	Receive and send data N
9	n. c.	–

Tab. 48 MSC800: pin assignment of the 9-pin D-Sub male connector “PROFIBUS”

5.5.2 Assignment of wire colors of assembled cables with open end

Cables no. 6021166 (5 m)/no. 6021175 (10 m) for connection CAN 1-IN, PVC-free



PIN	Signal	Function
1	Shield	–
2	CAN_V	Red
3	CAN_GND	Black
4	CAN_H	White
5	CAN_L	Blue

Tab. 49 Assignment of wire colors: cable no. 6021166/no. 6021175 (CAN 1-IN), PVC-free

6 Commissioning and configuration

No operation is required to operate the MSC800. Commissioning and diagnostics are carried out using the SOPAS-ET configuration software.

6.1 Overview of the commissioning steps

- Commission MSC800 using factory default settings.
- Connect a PC with the SOPAS-ET configuration software to the MSC800.
- To optimize the functionality of the logic unit, adapt the configuration of the MSC800.
- Test MSC800 for correct functionality in read operation.

6.2 SOPAS-ET configuration software

The SOPAS-ET configuration software can be used to adjust the MSC800 to the reading situation on location. The configuration data is stored and archived as a parameter set (project file) on the PC.

6.2.1 Functions of the SOPAS-ET configuration software for the MSC800 (overview)

The general functions of the software and its operation are described in the online help in the SOPAS-ET configuration software:

MENU, HELP, HELP F1

- Choice of the menu language (German, English)
- Setting up communication with the MSC800
- Password-protected configuration for different operating levels
- Recording of the data in continuous operation (recording and analyzing data of certain memory areas of the system with the data recorder)
- Diagnostics of the MSC800

6.2.2 System requirements for the SOPAS-ET configuration software

System requirements for the PC: see chapter **3.2.3 Operation requirements** on page 26 or Readme file on the DVD “Manuals & Software Identification & Measuring” (no. 2039442).

6.2.3 Installing the SOPAS-ET configuration software

1. Start the PC and put the DVD into the DVD drive.
2. When the autorun function of the DVD drive is active, the HTML start page of the DVD appears in the available browser.
3. Select the “Software” folder in the list in the top left.
4. In the list, select the entry “SOPAS-ET configuration software”. A table with information on SOPAS-ET will be displayed.
5. Under SOFTWARE FILE, select the “Download” entry.
6. In the FILE DOWNLOAD dialog window, either select installation direct from the DVD (“Run the program from here”) and confirm with OK. The installation is carried out automatically on hard disk C in the directory “Programs/SOPAS-ET”.

– or –

In the dialog window, select local saving (“Save the program”) and confirm with OK.

Specify the desired saving location in the SAVE AS dialog window. The “Setup.exe” file is saved locally.

After saving, start the file using OPEN in the dialog window.

7. The installation program starts and runs through the installation with on-screen messages in the dialog box. An entry is made in the Windows start menu under “Programs/SOPAS-ET”.
8. Confirm the final installation message with “OK”.

6.2.4 Default for SOPAS-ET configuration software

Parameters	Value
User interface language	English [1]
Units of length	Metric
User group (operating level)	Machine operator
Download parameters when a change is made	Immediately, temporarily (RAM of the MSC800)
Upload parameters after online switching	Automatically
Window arrangement	3 (project tree, help, working area)
Serial communication	COM 1: 9.600 Bd / 19.200 Bd, 8 data bits, 1 stop bit, no parity
[1] The software will need to be restarted after a change is made.	

Tab. 50 SOPAS-ET configuration software default (excerpt)

6.3 Initial commissioning

The logic unit of the MSC800 is adjusted to the reading situation on location using the SOPAS-ET configuration software. The starting point for this is the default factory settings, which can be adjusted to optimize the logic unit. In order to do this, the SOPAS-ET configuration software is used to create an application-specific parameter set, which can be loaded into the logic unit and saved and archived as a project file (spr file with configuration data) on the PC.

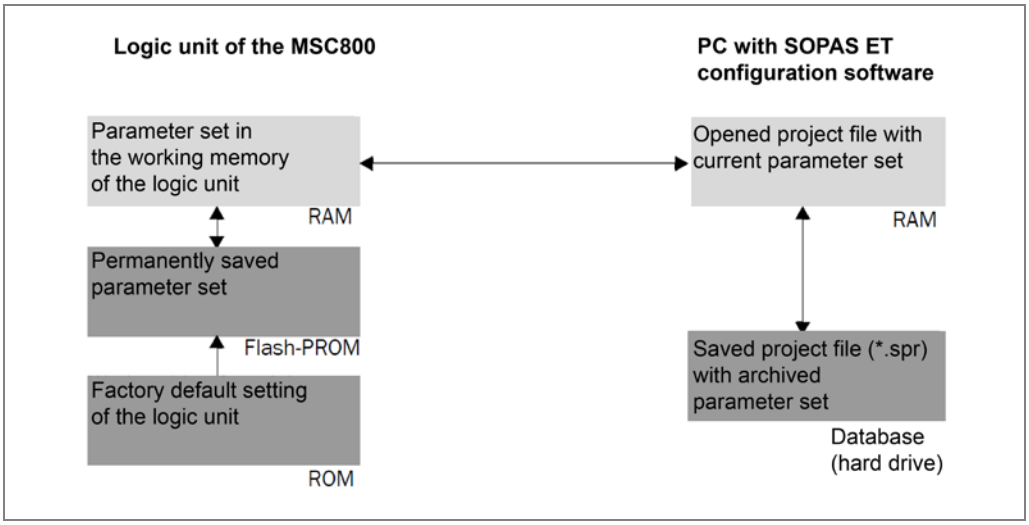


Fig. 30: Configuration with SOPAS-ET

6.3.1 Overview of the configuration steps

- Connect data interfaces of the PC and the MSC800.
- Launch SOPAS-ET configuration software and create new project file
- Configure scan assistant (activate communication of the PC)
- Establish communication with the MSC800.
- Include current configuration of the MSC800 in the project tree.
- Log in to the system as “authorized customer” with the password “client”.
- Configure MSC800 for application.
- If necessary use the diagnostic tools “read diagnosis” and “event monitor” (only presentation and recording of the output states of switching inputs and outputs as well as data transmissions to the host).
- Load optimized configuration onto the MSC800 and save permanently.
- Save project file with the configuration data of the MSC800 on the PC.

6.3.2 Establishing communication with the MSC800

Requirements For communication via TCP-IP, the TCP-IP protocol must be active on the PC.

Connecting data interfaces

➢ Connect the PC and MSC800 together as follows.

Connection via:	To data Interface:	Note
MSC800	ETHERNET 1 (10/100 Mbit/s)	Connect both the PC (Ethernet interface) and MSC800 (ETHERNET 1 connection) to a switch, using a patch cable in each case, or connect directly to each other using a crossover cable.
MSC800 (optional)	AUX 1 (RS-232)	Connect PC with 9-pin D-Sub male connector AUX 1 of the MSC800 via 3-wire null modem cable no. 2014054.

Tab. 51 Connection between PC with SOPAS-ET configuration software and the MSC800

Launching SOPAS-ET configuration software and calling up scan assistant

1. Switch on the supply voltage to the MSC800. The MSC800 and ID sensors perform a self-test and initialize.
2. Switch on PC and launch SOPAS-ET configuration software. The SOPAS-ET configuration software opens the program window with an English program interface as standard.
3. In order to change the language setting, click CANCEL and change the language of the program interface to GERMAN/DEUTSCH via the TOOLS/OPTIONS menu.
4. When the language setting has been changed, quit the SOPAS-ET configuration software and restart.
5. In the dialog window, select the CREATE NEW PROJECT option and confirm with OK.
6. In the main window, under SCAN ASSISTANT, click on the CONFIGURATION button. The SCAN ASSISTANT dialog window appears.

Configuring the Ethernet connection

1. In the SCAN ASSISTANT dialog window, under INTERNET PROTOCOL/IP COMMUNICATION, select the check box for ACTIVATE IP COMMUNICATION.
2. Click the ADD... button.
3. In the dialog window, enter the IP address of the MSC800 and confirm with OK. The dialog window is closed. A new entry appears in the ACTIVATE IP ADDRESSES list.
4. Confirm the settings with OK. The EXTENDED SCAN SETTINGS dialog window is closed.

TIP For establishing a connection via Ethernet quickly and easily, is available in the SOPAS-ET configuration software a CONNECTION ASSISTANT via the EXTRA menu.

Configuring optional serial connection

1. In the SCAN ASSISTANT dialog window, under SERIAL CONNECTION/STANDARD PROTOCOL, select the check box for ACTIVATE SERIAL COMMUNICATION.
2. Click the EXTENDED... button.
3. Under BITS PER SECOND, deactivate all data transmission rates apart from 57.6 kBd.
4. Select the following PORT SETTINGS: 8 data bits, no parity, 1 stop bit.
5. Confirm the settings with OK. The EXTENDED SCAN SETTINGS dialog window is closed.

Performing a scan

1. In the SCAN ASSISTANT dialog window, click the START SCAN button.
2. Select the listed devices (MSC800) and confirm with ADD DEVICE.
3. The connection is used to search for connected devices. The SOPAS-ET configuration software adds the devices found to the project tree and loads the current parameter set via upload (SYNC CHECK).
4. For information on device configuration, see chapter **6.3.3 Configuring MSC800** on page 77.

6.3.3 Configuring MSC800

All configurable parameters of the MSC800 are compiled together in a corresponding device description for the SOPAS-ET configuration software. The project tree of the device description is used as an aid for configuration.

The function of the relevant parameters is explained in a context-dependent manner in the online help (F1 key). The valid value range and the default are listed in the “PARAMETER INFO” display window (right-click with pointer placed over the parameter).

In order to configure a device with the SOPAS-ET configuration software, the appropriate operator level must first be selected. After starting, the SOPAS-ET configuration software works in the “Maintenance technician” user level (operator level).

1. Under EXTRAS in the menu bar, select the LOG IN TO DEVICE command.
2. Under USER LEVEL in the dialog window, in the list box select the AUTHORIZED CUSTOMER entry and enter the password “client” under PASSWORD. Confirm the dialog window with OK.

The parameters that were previously shown grayed out on the tabs are now accessible.

6.3.4 Loading amended parameter sets into the logic unit

Depending on the option (“Download immediately”), amended parameters are temporarily transferred directly into the logic unit of the MSC800. In order for the changes to be retained even after the MSC800 is restarted, however, the configuration must be permanently saved in the logic unit.

1. In order to load the current settings in the MSC800, select the PARAMETERS/SAVE PERMANENTLY command in the menu bar under MSC800.
2. Restart the MSC800.

6.3.5 Saving, displaying, and printing current parameter set

In order to archive a parameter set, in addition to saving the project file, it is advisable to print the file content.

1. In order to save the current parameter set, select the SAVE AS menu item in the menu bar under PROJECT.
2. In the dialog window, enter a file name and confirm with SAVE. The SOPAS-ET configuration software saves the current settings in a “*.spr” configuration file.
3. In order to print out the current parameter set, in the menu bar under PROJECT, select the PRINT/PRINT PREVIEW command. The SOPAS-ET configuration software displays a preview of all parameter values in table form.
4. In the dialog window, in the toolbar at the top click  . The PRINT dialog window for the configuration of the printer opens.
5. Edit the settings accordingly and confirm with OK. The current settings for the project are printed in table form on several pages.

TIP In order to save the current parameter set as a PDF, the PRINT/SAVE AS PDF FILE command is available in the menu bar under PROJECT.

6.4 Default

The values of the default are permanently saved both in the MSC800 (ROM) and in the database of the SOPAS-ET configuration software in the device-specific jar file.

A PC is not required for commissioning the MSC800 with the default settings.

Restoring MSC800 to the default

Requirements The SOPAS-ET configuration software is connected to the MSC800 online.

1. In order to completely discard the changes in the parameter set, in the menu bar under MSC800, select the PARAMETERS/LOAD DEFAULT command. The SOPAS-ET configuration software loads the default from the database and displays the parameter values in the tabs.
2. Under EXTRAS in the menu bar, select the LOG IN TO DEVICE command.
3. Under USER LEVEL in the dialog window, in the list box, select the AUTHORIZED CUSTOMER entry and enter the password “client” under PASSWORD. Confirm the dialog window with OK.
4. Under MSC800 in the menu bar, select the PARAMETERS/SAVE PERMANENTLY command. The SOPAS-ET configuration software transfers the default into the permanent parameter memory (Flash-PROM) of the MSC800.

6.5 Changing password

The respective password can now be parameterized for the MAINTENANCE TECHNICIAN, AUTHORIZED CUSTOMER and SERVICE user levels.

1. Log in to the respective user level in SOPAS.
2. Select the password command under MSC800 in the menu bar.

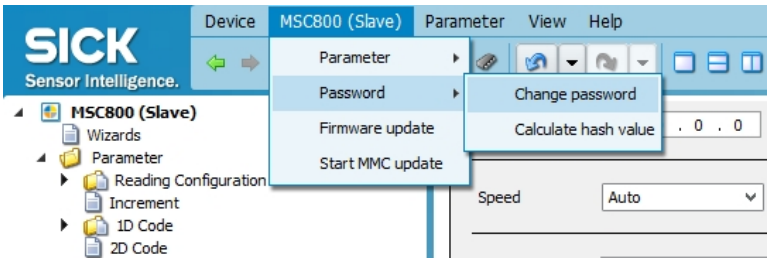


Fig. 31:SOPAS – password change command

3. Enter the old and new password and click on OK.

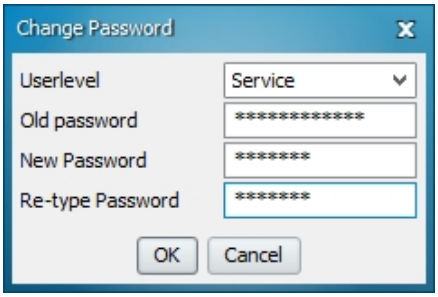


Fig. 32:SOPAS – dialog window for password change

4. The password is immediately permanently saved.

NOTE

If you are already logged into the user level for changing the password, the old password is not needed. Old incorrect passwords are therefore also ignored in this form.

If you log into a higher level, you can also define the password for lower levels.

If you change the password for the SERVICE level, deactivating the PARAMETERIZATION IS PASSWORD-PROTECTED parameter no longer has any effect. SOPAS is not able to log in automatically.

6.6 Deactivating TCP/IP CoLa protocol server

From the AUTHORIZED CUSTOMER user level, all TCP/IP CoLa protocol servers can be shut down via a uniform Ethernet interface. In this case, the MSC800 is largely protected against manipulation via SOPAS commands.

Using this setting in connected customer networks in general is recommended. Shutting down the CoLa protocol server includes all AUX and HOST interfaces.

➢ Double-click on the NETWORK / INTERFACES / IOS --> ETHERNET entry in the device tree. The additional DEACTIVATE TCP/IP COLA PROTOCOL SERVER check box is available.

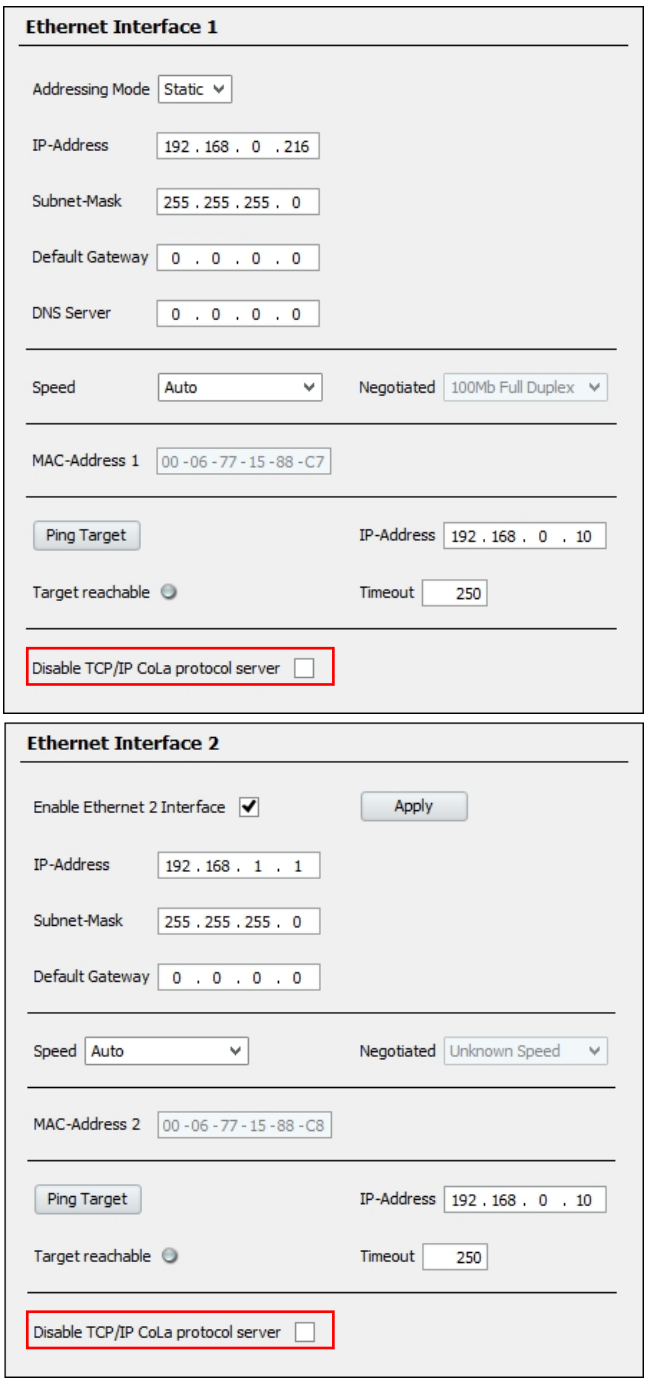


Fig. 33: SOPAS - deactivating CoLa protocol server

The activated DEACTIVATE TCP/IP COLA PROTOCOL SERVER parameter is not used right away. This is not done until you click on the APPLY button. In this way, you can permanently save the DEACTIVATE TCP/IP COLA PROTOCOL SERVER parameter before the SOPAS connection is completely terminated.

NOTE

If the DEACTIVATE TCP/IP COLA PROTOCOL SERVER parameter is activated for a single Ethernet interface, a device can no longer be addressed through this Ethernet interface via SOPAS.

If the parameter is activated for all available Ethernet interfaces, you must connected via the serial interface in order to perform other parameterization or diagnostics processes via SOPAS ET.

7 Maintenance

7.1 Maintenance during operation

The MSC800 is maintenance-free in operation, with the exception of type-dependent cleaning of the air inlet and outlet openings on the cabinet.

Recommendation

To protect the electrical components from damage caused by overheating, the air inlet and outlet openings on the cabinet of the MSC800-2100/-2300 and MSC800-3400/-3600 must be cleaned on a regular basis. Contaminated or clogged filter mats on the air inlet and outlet openings must be replaced immediately.

7.2 Cleaning the MSC800

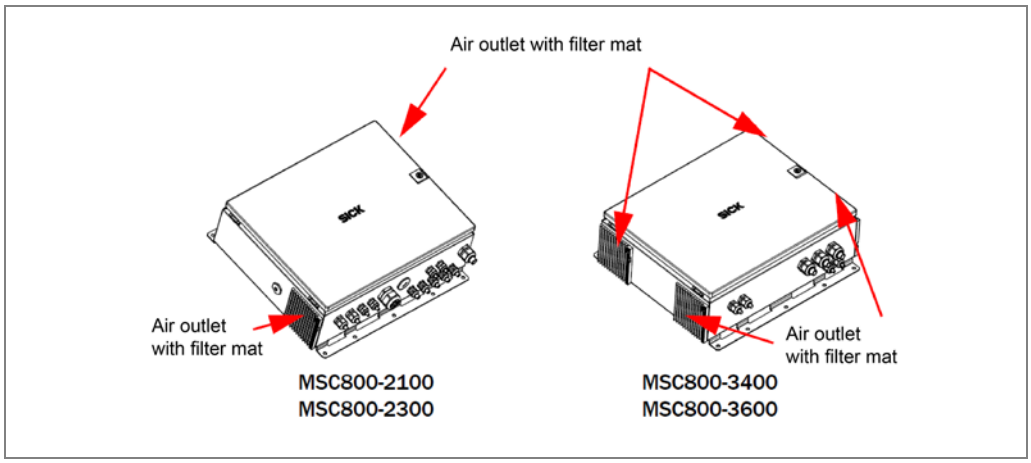


Fig. 34: Cleaning of the air inlet and outlet openings on the cabinet of the MSC800

Cleaning the air inlet and outlet openings (MSC800-2100/-2300 and MSC800-3400/-3600)

In order to ensure sufficient cooling of the power supply units in the variants MSC800-2100/-2300 and MSC800-3400/-3600, it must be ensured that the air inlet and outlet openings are clean. This applies in particular in harsh operating environments (dust, abrasion, etc.).

- ➢ Use a soft brush to clear any dust from the air inlet and outlet openings (louvered grills) on the sides of the cabinets.

Replacing filter mat in the air inlet and outlet openings (MSC800-2100/-2300 and MSC800-3400/-3600)

There is a filter mat behind each of the louvered grills of the air inlet and outlet openings of the MSC800-2100/-2300 and MSC800-3400/-3600. Contaminated or clogged filter mats can cause the power supply units to overheat, and therefore must be replaced with new, unsaturated ones immediately. It is not necessary to open the MSC800 cabinet in order to do this.

Recommendation

Always replace all filter mats for the air inlet and outlet openings together.

1. When carrying out replacement, disconnect the MSC800 from the supply voltage so that the fan wheels are safely shut down.
2. Loosen all covers of the air inlet and outlet openings on both sides of the cabinets and fold downwards (by a maximum of 70°).
3. In order to release the lock, use your finger to carefully pull the blue function logo in the louvered grills slightly upwards.
4. Remove used filter mats and replace each with a new filter mat. Insert the new filter mats in the correct lateral position in the recess. The compressed side of the filter mat points to the fan wheel.
5. Fold up the covers again and carefully press down until the lock audibly engages.

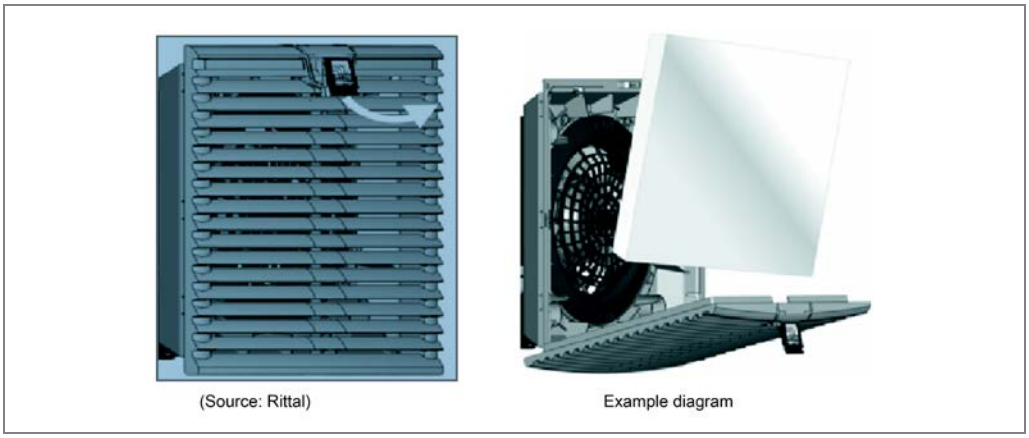


Fig. 35: Unlocking the cover and replacing the filter mats in the air inlet and outlet openings on the cabinet of the MSC800

7.3 Cleaning optical effect surfaces on sensors

Depending on how the reading system is equipped, sensors may be installed with optical effect surfaces (MLG, read cycle photoelectric sensors). Contamination on these sensors can result in faulty switching behavior.

➢ To avoid faulty switching behavior, remove contamination from the optical effect surfaces of the sensors.

7.4 Checking incremental encoder

When using an incremental encoder, the position of the friction gear on the drive technology must be checked regularly.

➢ Make sure that the incremental encoder is in direct and secure contact with the drive technology and that the friction gear is not slipping as it turns.

7.5 Replacing components of the MSC800

Faulty or damaged components of the MSC800 (logic unit, power supply unit modules) must be dismantled and replaced with new or repaired components.

NOTE

Risk of damage to the MSC800

Repair work on the MSC800 may only be performed by qualified and authorized service personnel from SICK AG.

7.5.1 Replacing logic unit of the MSC800-1100, MSC800-2100, or MSC800-2300

Removing connecting cables

1. Switch off the supply voltage to the MSC800.
2. Disconnect all male cable connectors, female cable connectors, and pluggable terminals from the logic unit and pull them out.

Replacing the MSC800-0000 logic unit

1. Remove the memory card (SD 1) with the saved parameter set from the defective logic unit (see chapter **3.5.1 Operator interface** on page 34).
2. Insert the memory card into the opening (SD 1) in the new logic unit.
3. Dismantle the defective logic unit from the cabinet of the MSC800. To do this, loosen the fixing screw on the left side of the logic unit and push the logic unit out to the right.
4. Install the new logic unit into the cabinet of the MSC800 in the reverse order.

Reconnecting the cables

1. Insert and re-connect all male cable connectors, female cable connectors, and pluggable terminals into the logic unit.
2. Switch on the supply voltage to the MSC800. The MSC800 starts and, after initialization, loads the parameter set from the memory card to the permanent parameter memory (Flash PROM) of the logic unit.
3. If the real-time clock of the logic unit is used as the system time in the process, set it to the correct time based on the location. See chapter **7.5.3 Replacing the battery in the logic unit** on page 86.

7.5.2 Replacing the MSC800 power supply unit module

DANGER

Risk of injury due to electrical current

The MSC800 is connected to the mains voltage (AC 100 ... 264 V / 50 ... 60 Hz).

➢ Comply with standard safety requirements when working on electrical plants.

1. Switch off the supply voltage to the MSC800.
2. Disconnect and remove all cables from the power supply unit module. When doing so, note the assignment of cables to connections.
3. Dismantle the defective power supply unit module from the cabinet of the MSC800. To do this, use a suitable screwdriver to slide the black clip forward on the bottom of the power supply unit module.

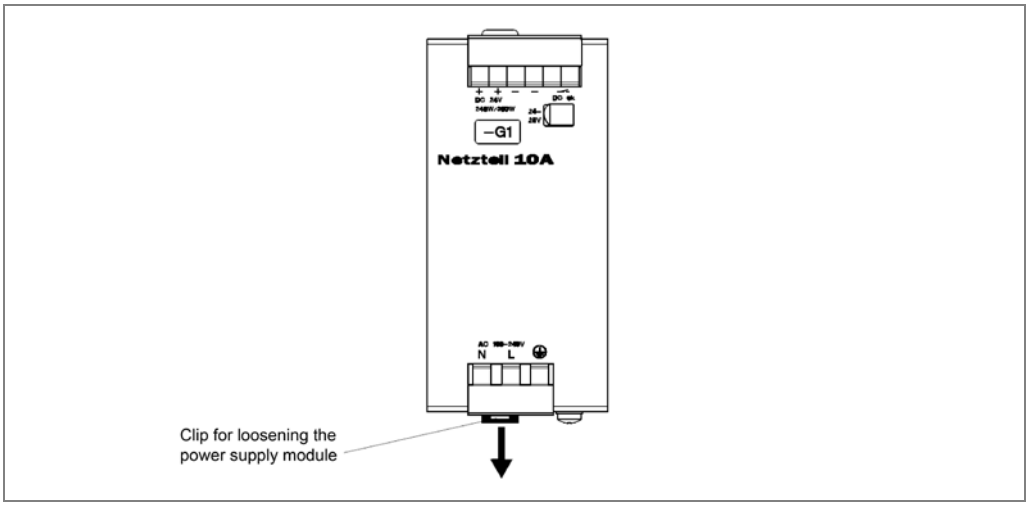


Fig. 36: Dismantling power supply unit module

4. Lift the power supply unit module and pull it forward and out of the bracket.
5. Place the new power supply unit module on the mounting rail of the MSC800 and press down until the power supply unit module audibly engages.
6. Reconnect all the cables to the power supply unit module.
7. Switch on the supply voltage to the MSC800.

7.5.3 Replacing the battery in the logic unit

The real time clock of the logic unit is powered by a battery (buffered if the supply voltage of the MSC800 fails/is switched off). If this battery is flat, it has to be replaced (can be identified when using the real-time clock in the process after restarting the MSC800: time of the logic unit starts with 00:00).

1. Remove black plastic cover on the logic unit.

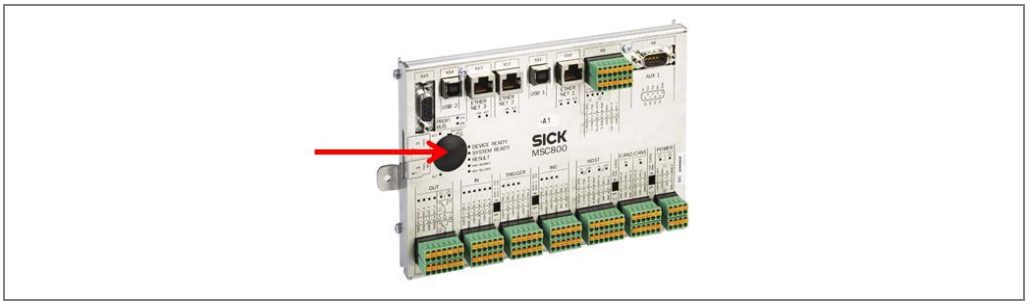


Fig. 37: MSC800: position of the battery in the logic unit

2. Remove the battery from the bracket and replace it with a new type CR2032 (3 V) battery.
3. Put the black plastic cover back in place.

Important

4. Dispose of the old battery as hazardous waste as per the ROHS directives (Europe).
5. Re-set the system time using the SOPAS-ET configuration software.

Setting the system time of the MSC800

Requirements

The MSC800 must be connected to the SOPAS-ET configuration software.

1. Log in to the MSC800 in the “Service” user level using the password “Servicelevel”.
2. In the device tree, double-click on the SYSTEM entry.
3. In the REAL TIME CLOCK tab, click the SET REAL TIME CLOCK button.
4. Apply the settings in the dialog window.
5. Download to the MSC800.

7.6 Disposal

Unusable or irreparable devices must be dismantled and disposed of in an environmentally safe manner in accordance with the relevant applicable national waste disposal regulations.

SICK AG is not currently able to take back devices that are unusable or irreparable.

Dismantling the MSC800 for decommissioning

1. Switch off the supply voltage to the MSC800.
2. Disconnect and remove all connecting cables from the MSC800.
3. Unscrew and remove MSC800 from the mounting frame.

Disposing of the MSC800

4. Dismantle *cabinet* of the MSC800.
5. Dismantle the electronic modules of the MSC800.
6. Remove the battery in the MSC800 logic unit from the bracket and dispose of it as hazardous waste in compliance with the ROHS directives (Europe).
7. Dispose of electronic components as hazardous waste.
8. Send the cabinet and cover of the MSC800 and the connecting cables for metal recycling.

8 Troubleshooting

This chapter describes how to identify and remedy faults on the MSC800 modular system controller.

For additional information see the “High-End CCD Camera System ICR890” operating instructions and operating instructions of the other system components.

8.1 Overview of potential errors and faults

8.1.1 Errors during mounting

- MSC800 cabinet placed in the wrong position on the mounting frame.
  - Cables are not long enough.
  - Cabinet cannot be opened.
  - Air inlet or outlet openings are covered.

Read cycle sensor incorrectly positioned (e.g., internal reading interval is opened too late or closed too early), incremental encoder (optional) incorrectly positioned.

8.1.2 Error during electrical installation

- Interfaces of the MSC800 incorrectly wired

8.1.3 Errors during configuration

- Functions not adapted to local conditions, e.g., parameters for the main data interface not set correctly.
- Trigger source for read cycle not selected correctly

8.1.4 Faults during operation

- Start/stop operation: external read cycle missing, more than one object is in the reading field.
- Tracking operation: minimum distance of the objects in the conveying direction not met
- Device faults (hardware/software)

8.2 Detailed fault analysis

8.2.1 System information

The MSC800 outputs faults in different ways. Fault output is staggered, allowing for an increasingly detailed level of analysis:

- Communication errors can occur when transmitting telegrams to the MSC800. The MSC800 then returns a fault code.
- For faults that occur during reading, fault codes are written to a status log.

8.2.2 Status log

- The status log is retained even after switching the device off and on again.
- The system distinguishes between four types of faults:
  - Information
  - Warning
  - Fault
  - Critical fault

  The system saves only the last five entries for each fault type.

Display the status log using the SOPAS-ET configuration software.

To display the status log, the SOPAS-ET configuration software must be connected online with the MSC800.

➢ Connect the SOPAS-ET configuration software to the device.

➢ Open the project tree MSC800, SERVICE, SYSTEM STATUS, tab SYSTEM INFORMATION.

8.3 SICK support

If the fault cannot be rectified using the measures described above, the MSC800 may be defective. The MSC800 components cannot be repaired by the user in order to restore its functionality after a failure. However, the user can replace the MSC800 components quickly. See chapter **7.5 Replacing components of the MSC800** on page 84.

➢ If a fault cannot be rectified, please contact the SICK Service department:

- In Germany: technical hotline for SICK Vertriebs-GmbH,

  Tel. +49 211 5301 031, fax. +49 211 5301-302, E-mail: Kundenservice@sick.de.
- Abroad: contact responsible SICK branch or SICK subsidiary.

  For telephone numbers and email addresses, please see the back page of these operating instructions. See www.sick.com for mailing addresses.

➢ Please only dispatch devices after consulting SICK Service.

9 Technical data

9.1 MSC800 data sheet

Type	MSC800-1100 MSC800-2100	MSC800-2300	MSC800-3400 MSC800-3600
Function	Logic unit [1] and power supply unit for max. 14 CLV490	Logic unit [1] and power supply unit for CLV network and one ICR890 system	Additional power supply unit for max. two/three ICR890 systems
MTBF of the device	> 80,000 h		
MTTR of the device	< 5 min (per component)		
Number of ICR890 systems per logic unit	8	8	–
Number of CLV490 bar code scanners per logic unit	24	24	–
Number of VMS per logic unit	1	1	–
Optical indicators	2 × LED per power supply unit module 6 x LED fuse module (12-pin terminal block), only MSC800-1100/-2100/-2300 48 x LED logic unit Function of the LEDs chapter **3.5.2 Function of the LEDs** on page 35		
"Host 1/2" data interface	Serial: RS-232, RS-422/485, Ethernet, Profibus-DP Data format (serial) and output format can be adjusted		
Data transmission rate, serial	0.3 ... 115.2 kBd (RS-232, RS-422/485)		
Logs	SICK Standard, application-specific protocols on request		
"AUX 1/2" data interface	Serial: RS-232, RS-422/485 (57.6 KBd); Ethernet Data format (serial) and output format can be adjusted		
Data transmission rate, serial	0.3 ... 115.2 kBd (RS-232, RS-422/485)		
"Ethernet" data interface	10/100 MBit/s, TCP/IP, FTP, half/full duplex		
"PROFIBUS-DP" data interface	12 MBd		
"CAN" data interface	2 x, 20 KBit/s ... 1 MBit/s, CANopen® protocol, CAN SENSOR network		
Digital switching inputs IN	14 x digital (6 x IN, 4 x TRIGGER, 4 x INC), configurable, PNP, opto-decoupled, U_{emax} = 28 V, reverse polarity protected Function: start/stop read cycle, incremental signal, etc. Control: time-based or route-based Debouncing: min. 3 ms Logic level can be selected (Low -> High, High -> Low)		
Digital switching outputs OUT	4 x digital, configurable, PNP, I_{amax} = 100 mA, short-circuit protected Function: Device Ready (stat.), System Ready, Good Read, No Read, Temperature, etc., pulse duration can be adjusted (stat., 0 ... 65,535 ms or 0 ... 10,000 mm) Logic level can be selected (Low -> High, High -> Low)		
Relay outputs OUT	2 x relay, U_{Switch} = max. DC 30 V, I_{Switch} = max. 1 A		
Electrical connections	1 x service socket (only MSC800-1100/-2100, MSC800-2300) Supply voltage IN: -X100 terminal block Supply voltage OUT: -X120 terminal block Supply voltage OUT: 12-pin terminal block (only MSC800-1100/-2100/-2300) Logic unit: 1 x 9-pin D-Sub male connector (AUX 1) 3 x 8-pin RJ45 female connector (ETHERNET) 2 x USB female connector, type B 1 x 9-pin D-Sub female connector (PROFIBUS-DP) 9 × double row terminal blocks, pluggable (all terminals as spring-loaded terminals, for permitted wire cross sections, see chapter **5.4.1 Wire cross-sections** on page 57)		

Type	MSC800-1100 MSC800-2100	MSC800-2300	MSC800-3400 MSC800-3600
Cable entries	See chapter **5.4.3 Cable entries** on page 58		
Fuses	See chapter **5.4.5 Circuit breakers and fuses** on page 60		
Fan	MSC800-2100/-2300: 1 fan, temperature-controlled MSC800-3400/-3600: 2 fans, temperature-controlled Switching on/off temperature 37.5 °C		
Supply voltage	AC 100 ... 264 V / 50 ... 60 Hz		
Power supply unit module output voltage	DC +24 V		
Power supply unit module current output	10 A	30 A	MSC800-3400: 40 A MSC800-3600: 60 A
Logic unit power consumption	Typ. 10 W		
Battery for real time clock	Button cell, type CR 2032; 3.0 V		
Cabinet	Steel[2)], painted	Steel, painted	Steel, painted
Electrical safety	Acc. to EN 61439-2: 2011-10		
Protection class	I, as per EN 61140 (2002-03); A1 (2006-08)		
Enclosure rating (as per EN 60529 (1991-10); A1 (2002-02))	MSC800-1100: IP 65 MSC800-2100: IP 54	IP 54	IP 54
EMC test	As per EN 61000-6-2 (2001-10), EN 61000-6-4 (2001-10)		
Thorough vibration/shock check	As per IEC 68-2-6/ IEC 68-2-27		
Dimensions	MSC800-1100: See dimensional drawing on page 92 MSC800-2100: See dimensional drawing on page 93	See dimensional drawing on page 94	See dimensional drawing on page 95
Weight	Incl. power supply unit module: MSC800-1100: approx. 10 kg MSC800-2100: approx. 15.6 kg	Incl. power supply unit modules: Approx. 16.5 kg	Incl. power supply unit modules: MSC800-3400: approx. 17.2 kg MSC800-3600: approx. 19.3 kg
Mounting	MSC800-1100: 2 perforated plates each with 3 holes 8.7 mm MSC800-2100: 2 perforated plates with 5 holes each 8.7 mm	2 perforated plates with 5 holes each 8.7 mm	2 perforated plates with 5 holes each 8.7 mm
Ambient operating temperature/storage temperature	0 ... +40 °C/–20 ... +70 °C		
Max. rel. air humidity	≤ 95%, non-condensing		
Color	Light gray (RAL 7035)		

1) With labeling MSC800-0000.

2) Outside of the cabinet, no materials using silicon.

Tab. 52 MSC800 technical specifications

9.2 Dimensional drawings

9.2.1 Dimensional drawing for the MSC800-1100

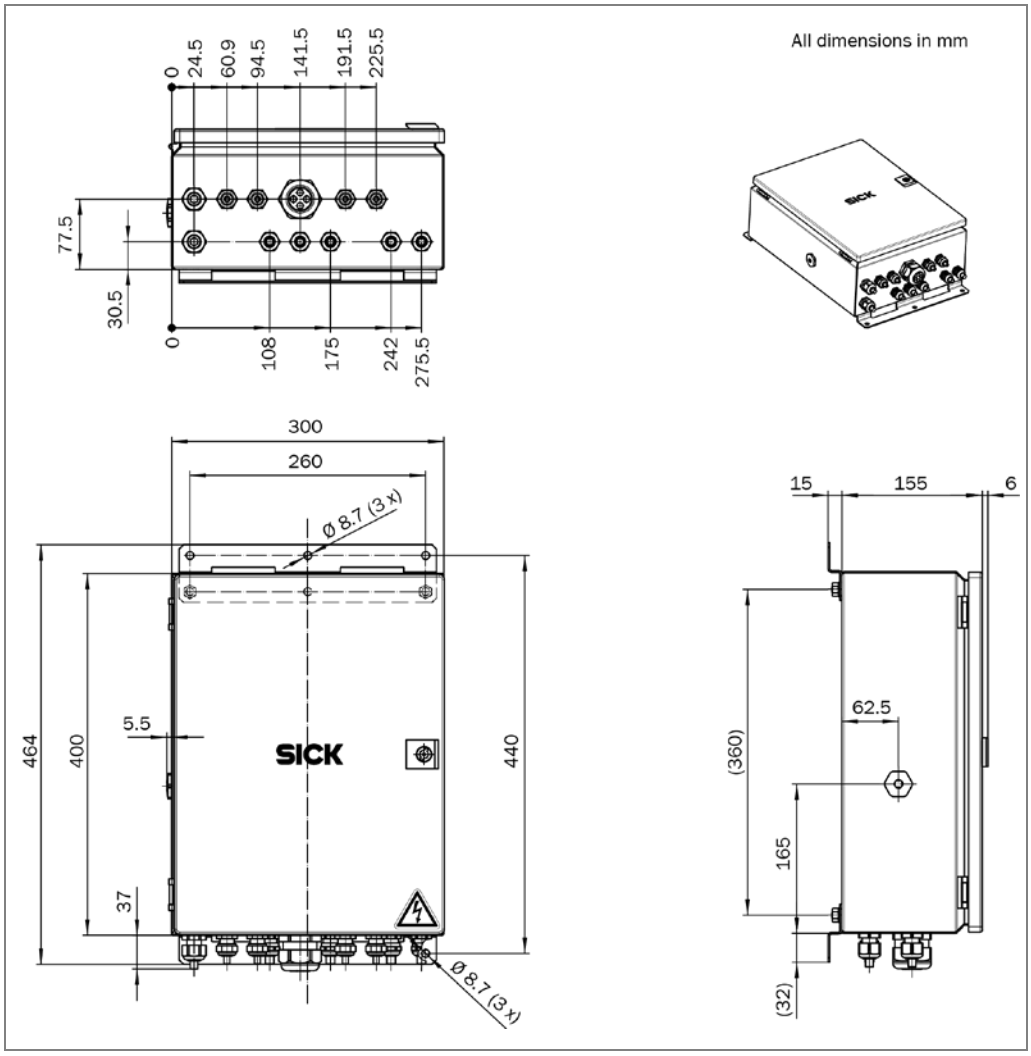


Fig. 38: Dimensions of the MSC800-1100

9.2.2 Dimensional drawing for the MSC800-2100

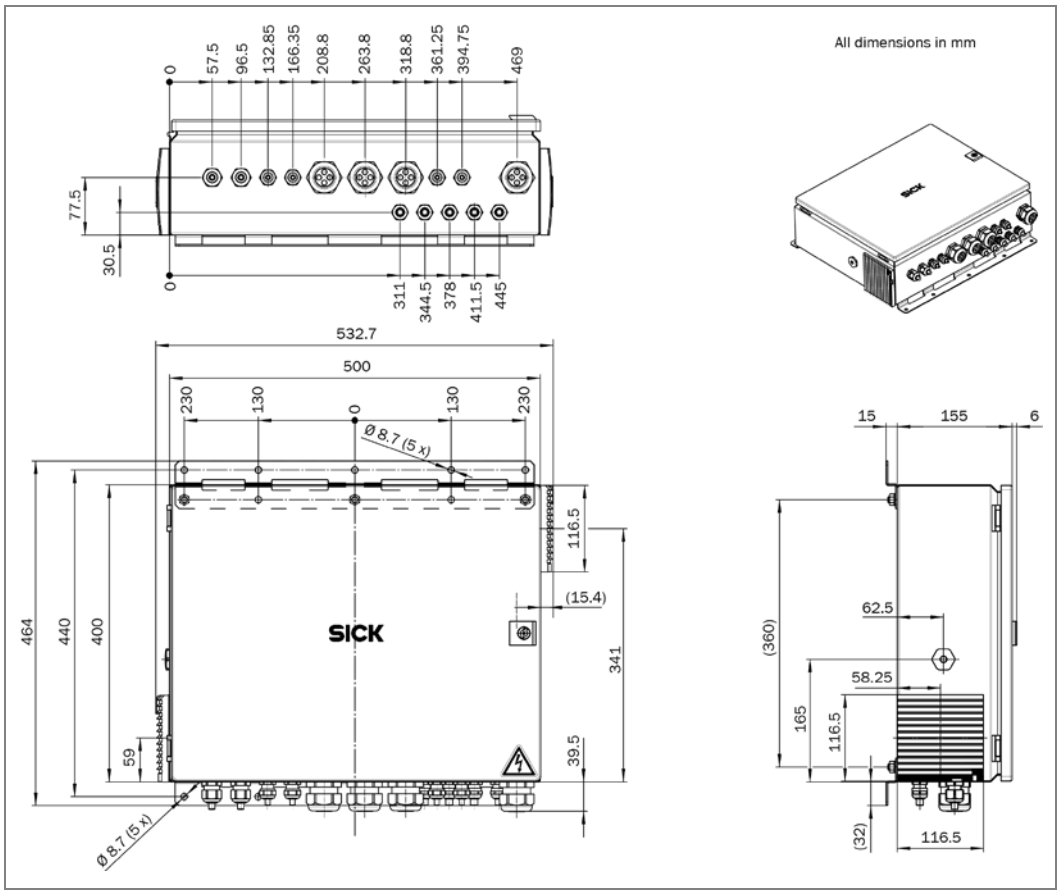


Fig. 39: Dimensions of the MSC800-2100

9.2.3 Dimensional drawing for the MSC800-2300

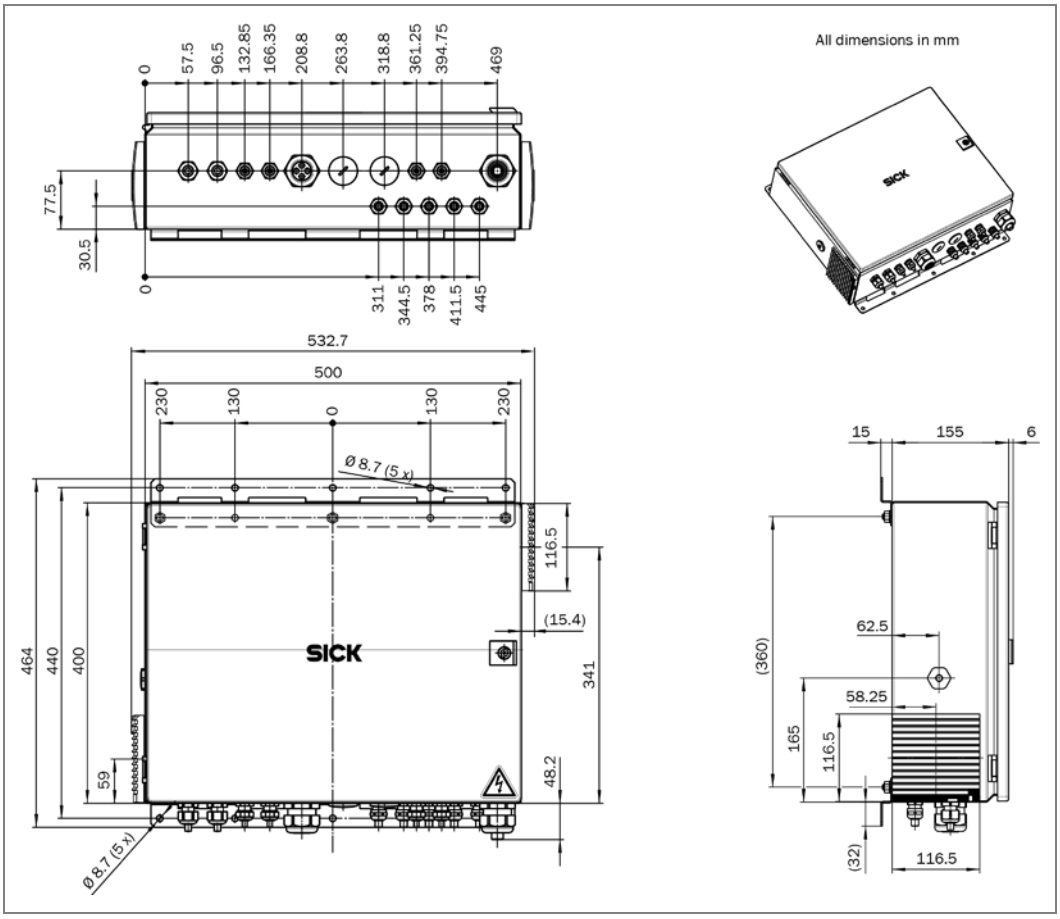


Fig. 40: Dimensions of the MSC800-2300

9.2.4 MSC800-34000/-3600 dimensional drawing

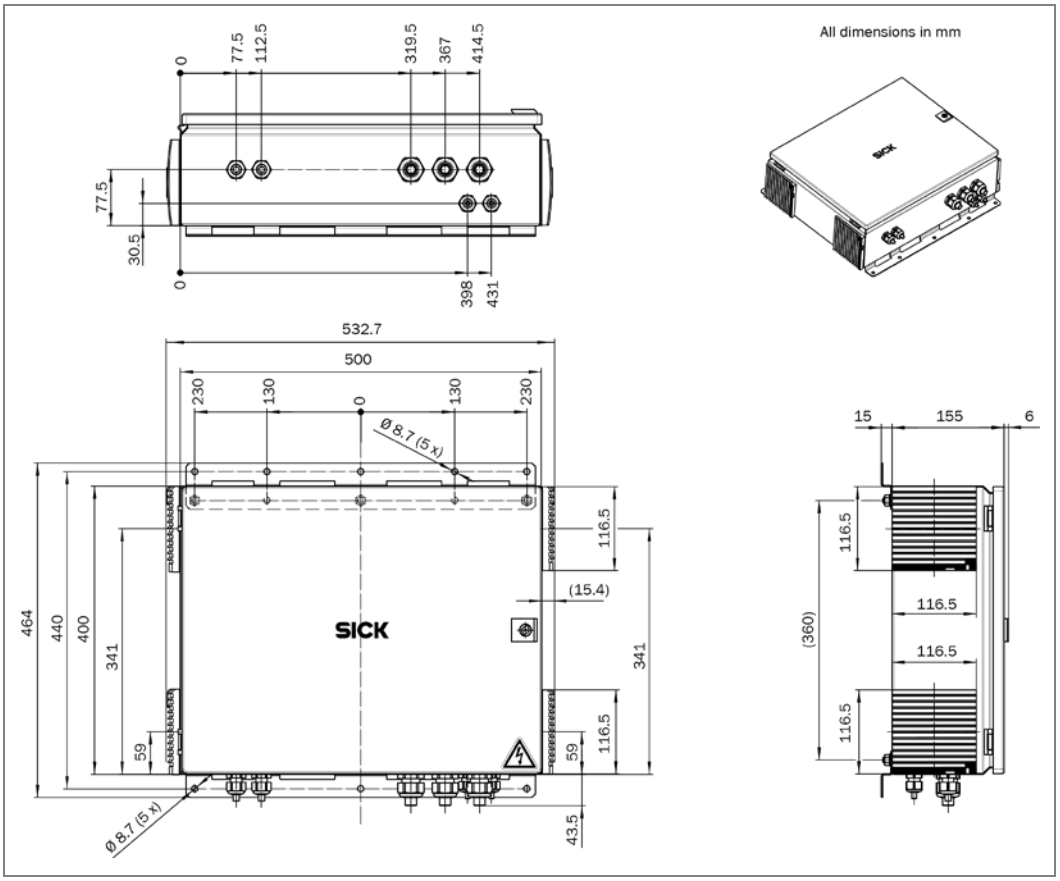


Fig. 41: Dimensions of the MSC800-3400/-3600

9.3 Circuit diagrams

9.3.1 MSC800-1100 circuit diagram

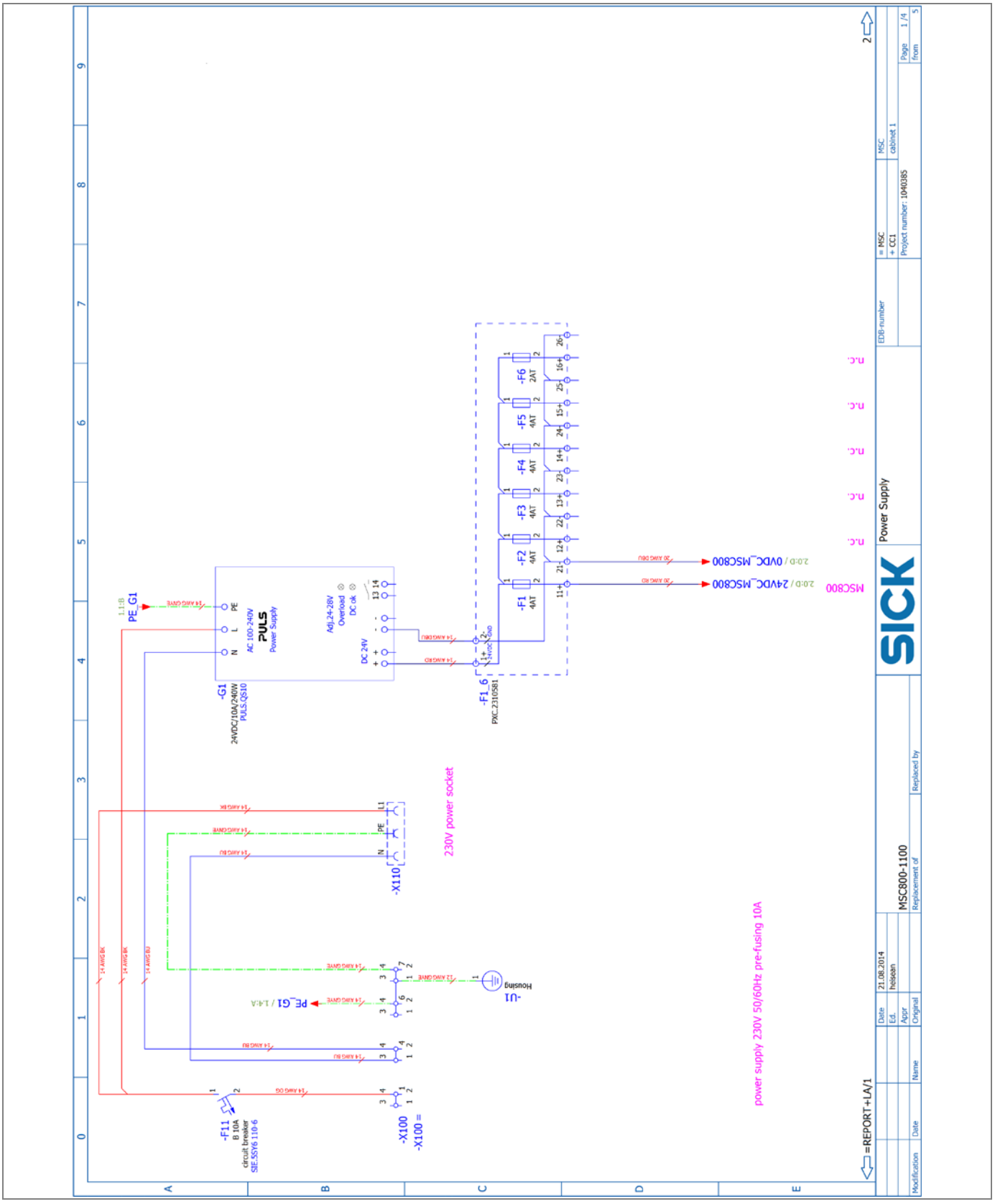


Fig. 42: MSC800-1100 circuit diagram: power supply

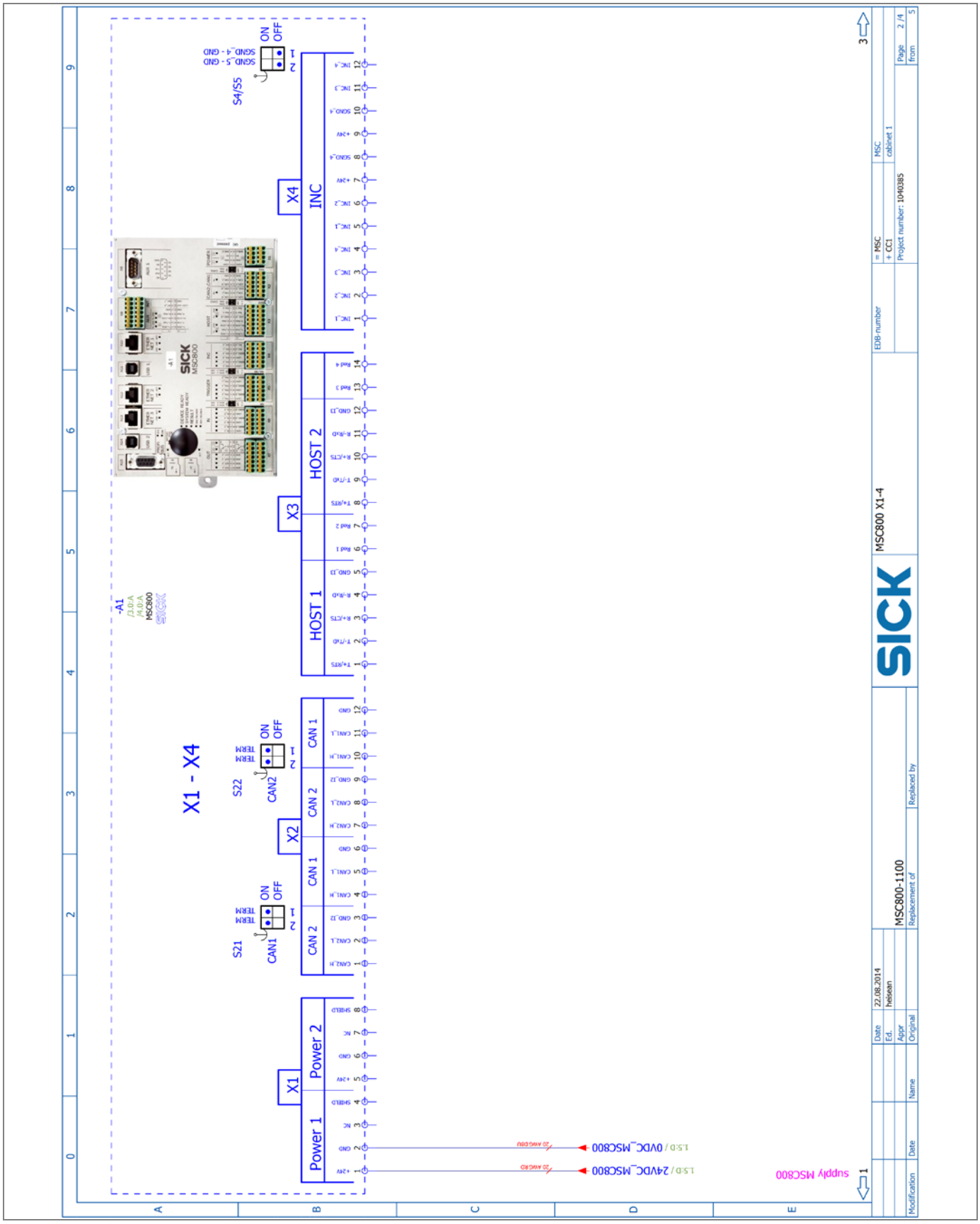


Fig. 43: MSC800-1100 circuit diagram: X1-4

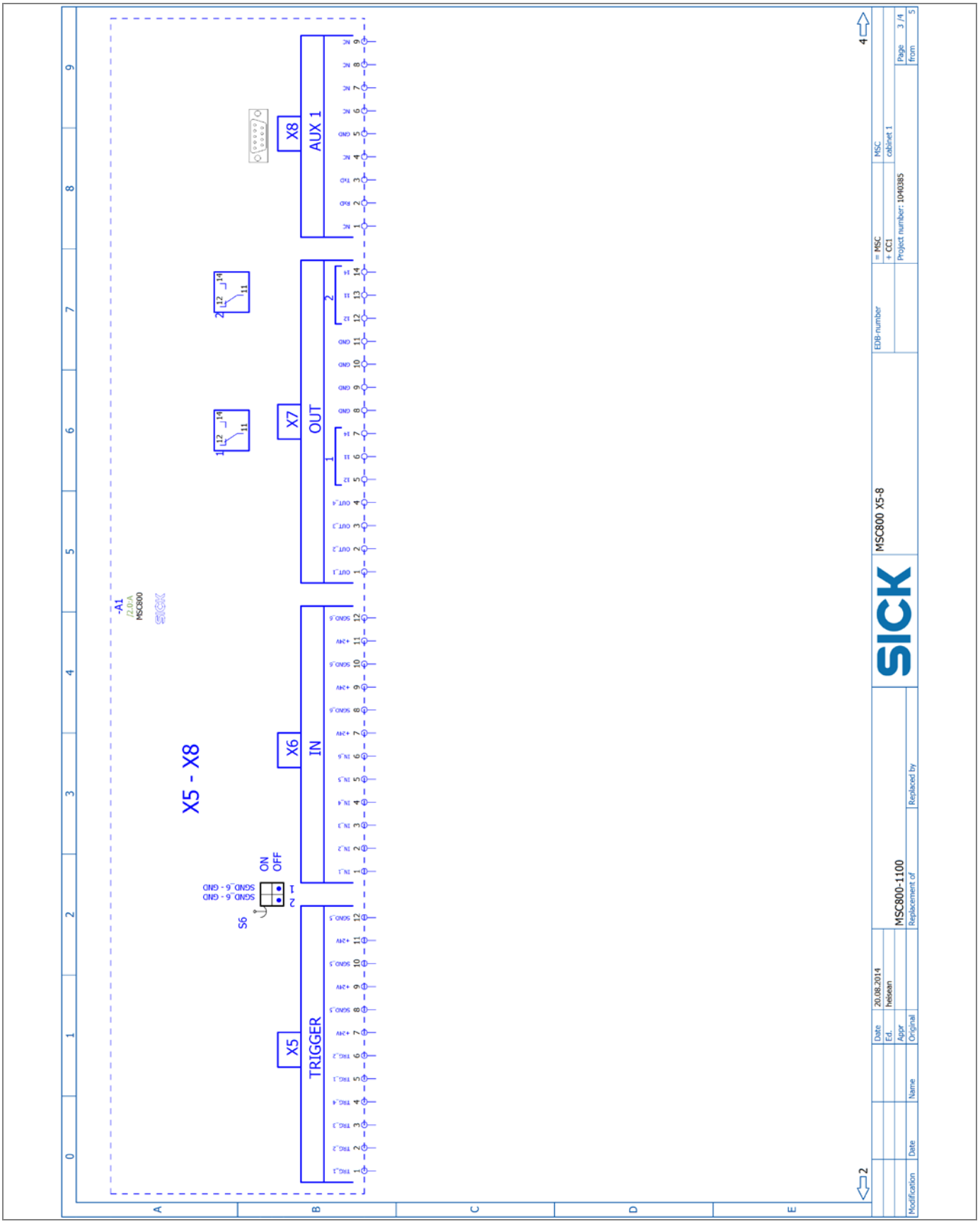


Fig. 44: MSC800-1100 circuit diagram: X5-8

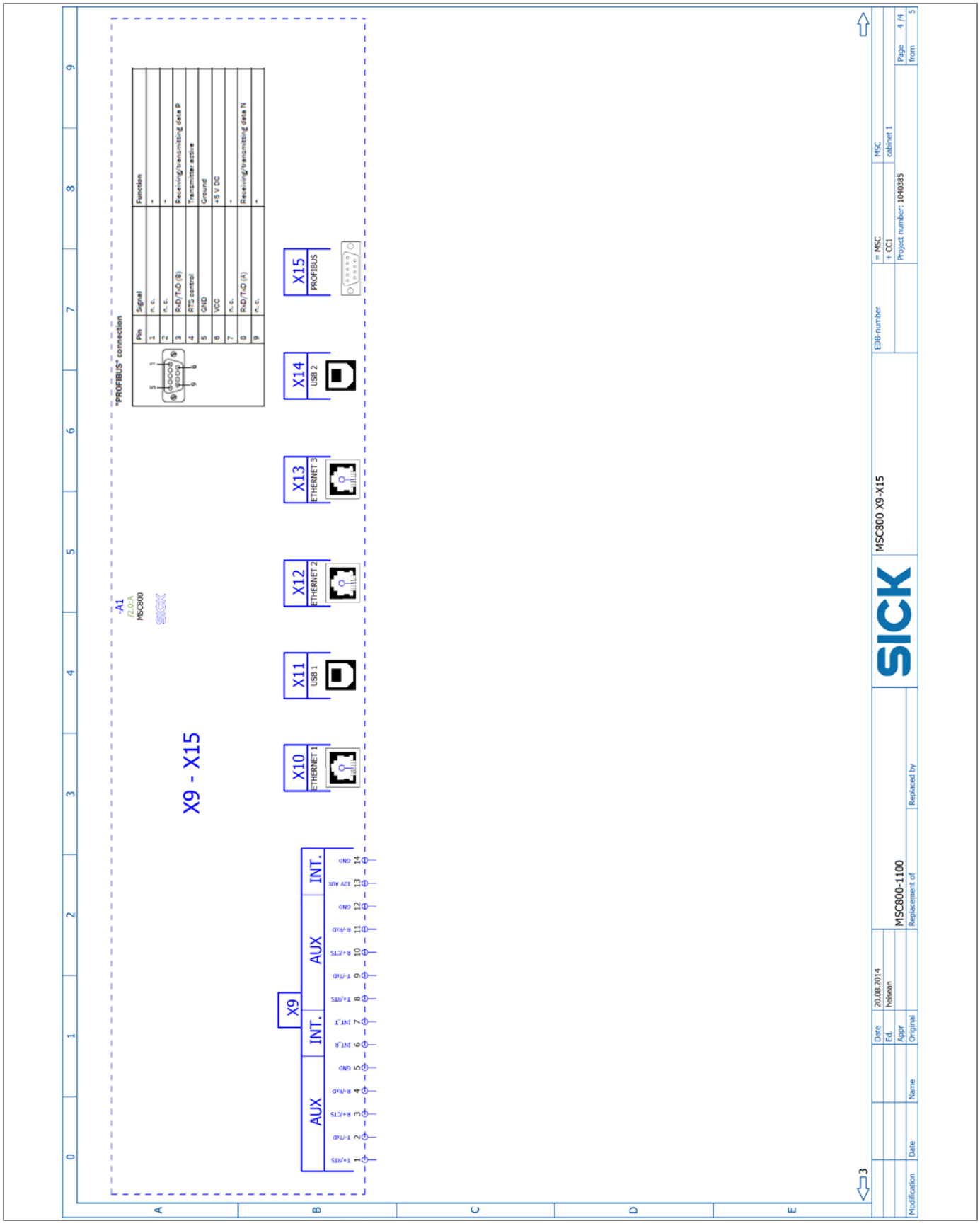


Fig. 45: MSC800-1100 circuit diagram: X9-15

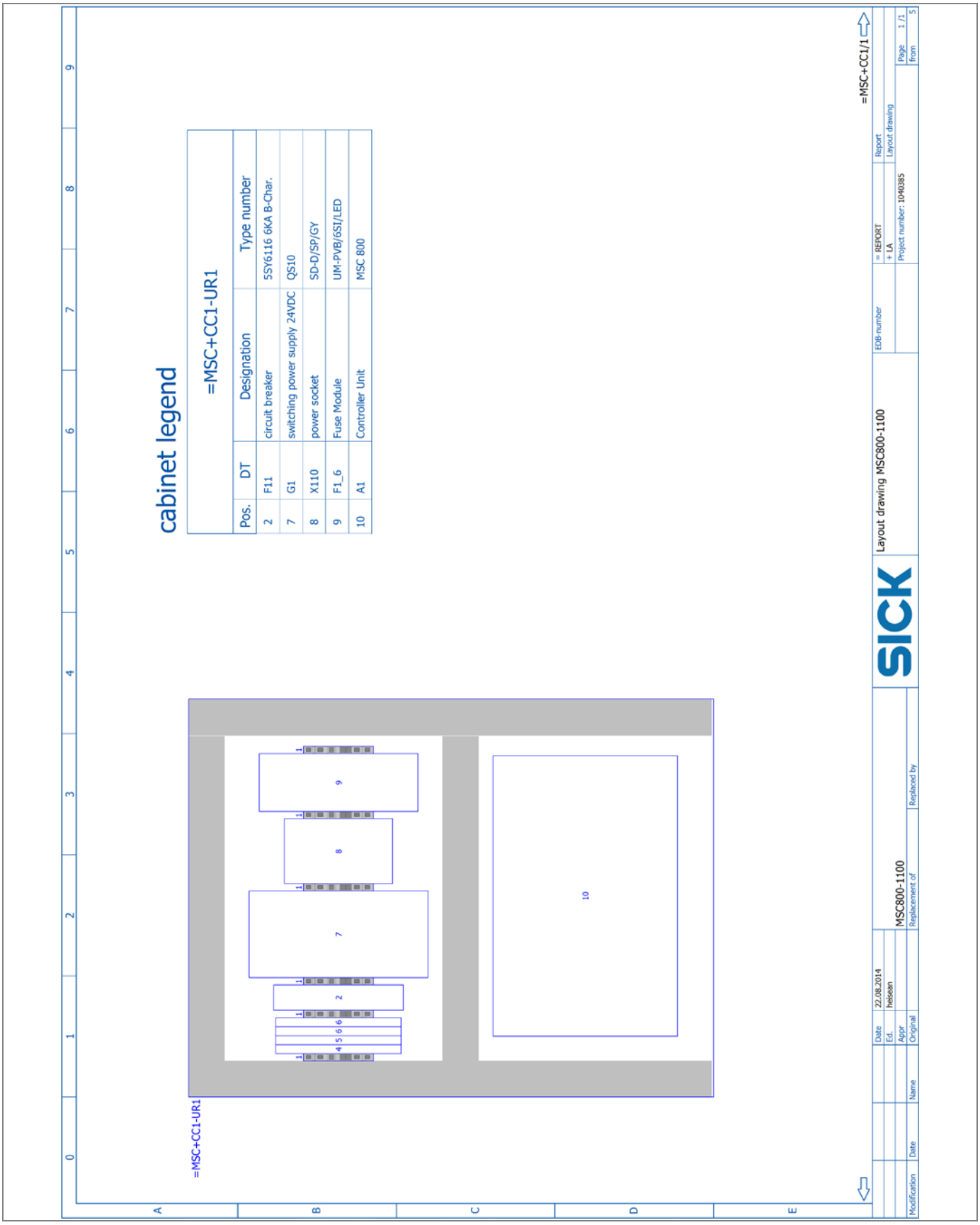


Fig. 46: MSC800-1100 circuit diagram: legend

9.3.2 MSC800-2100 circuit diagram

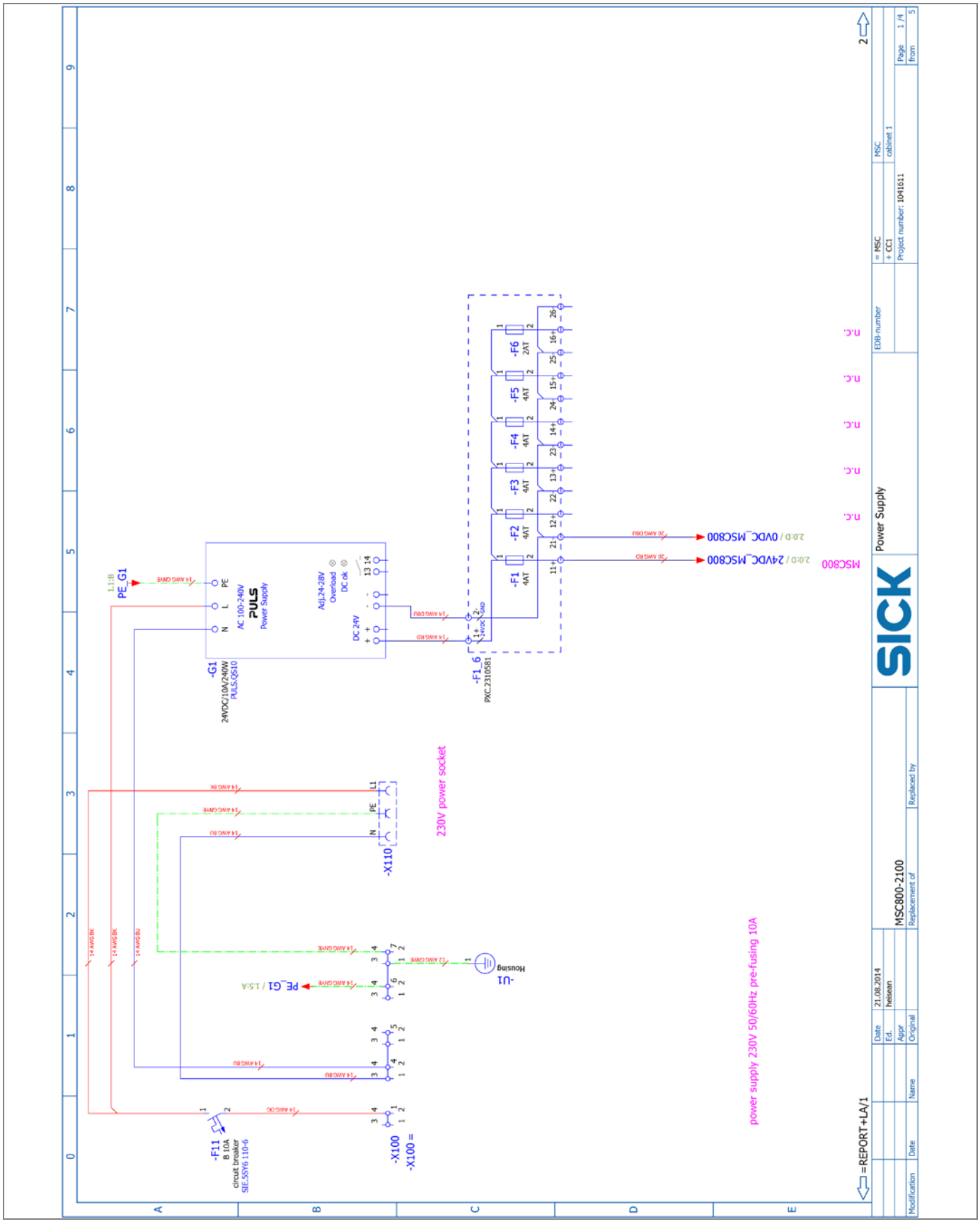


Fig. 47: MSC800-2100 circuit diagram: power supply

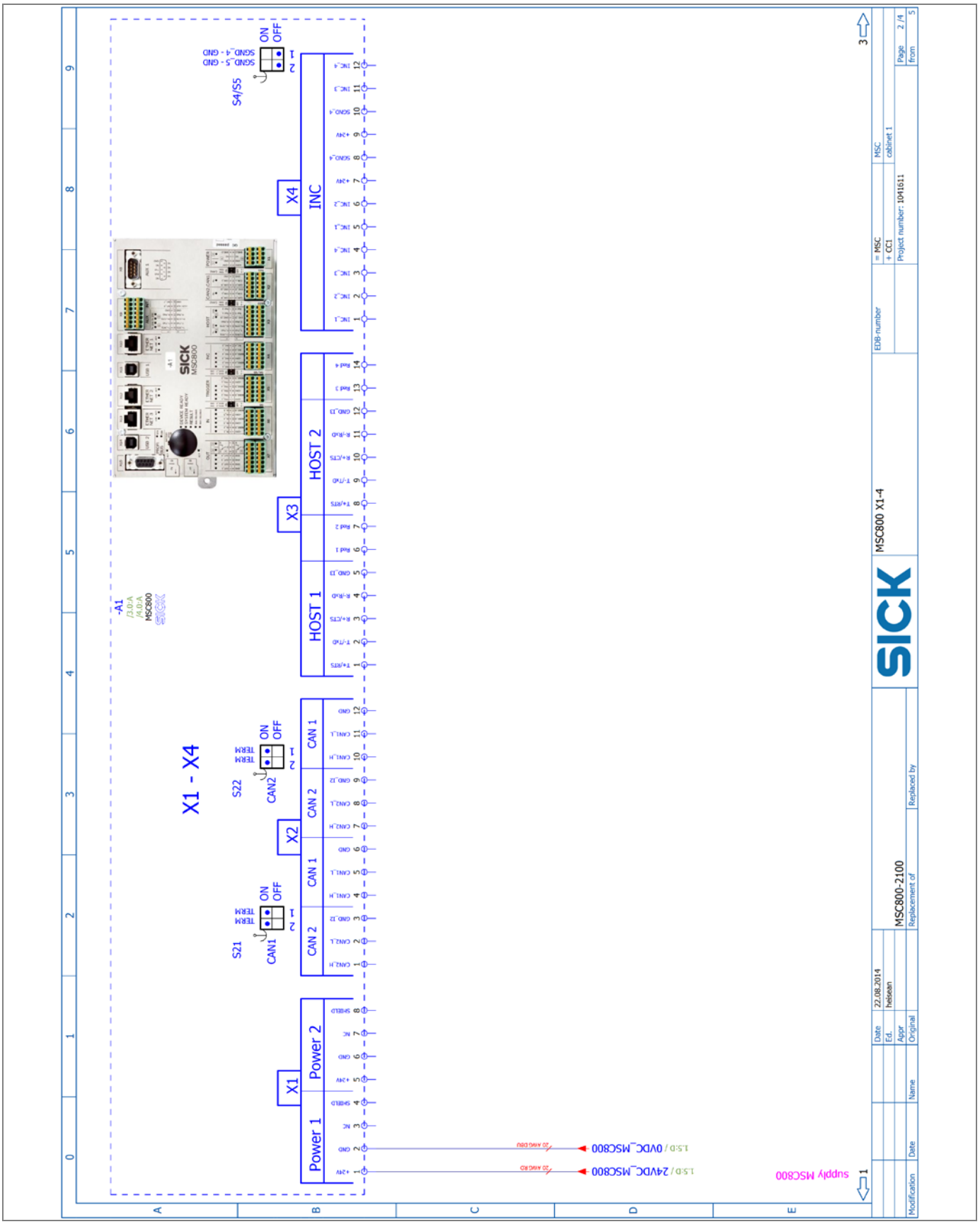


Fig. 48: MSC800-2100 circuit diagram: X1-4

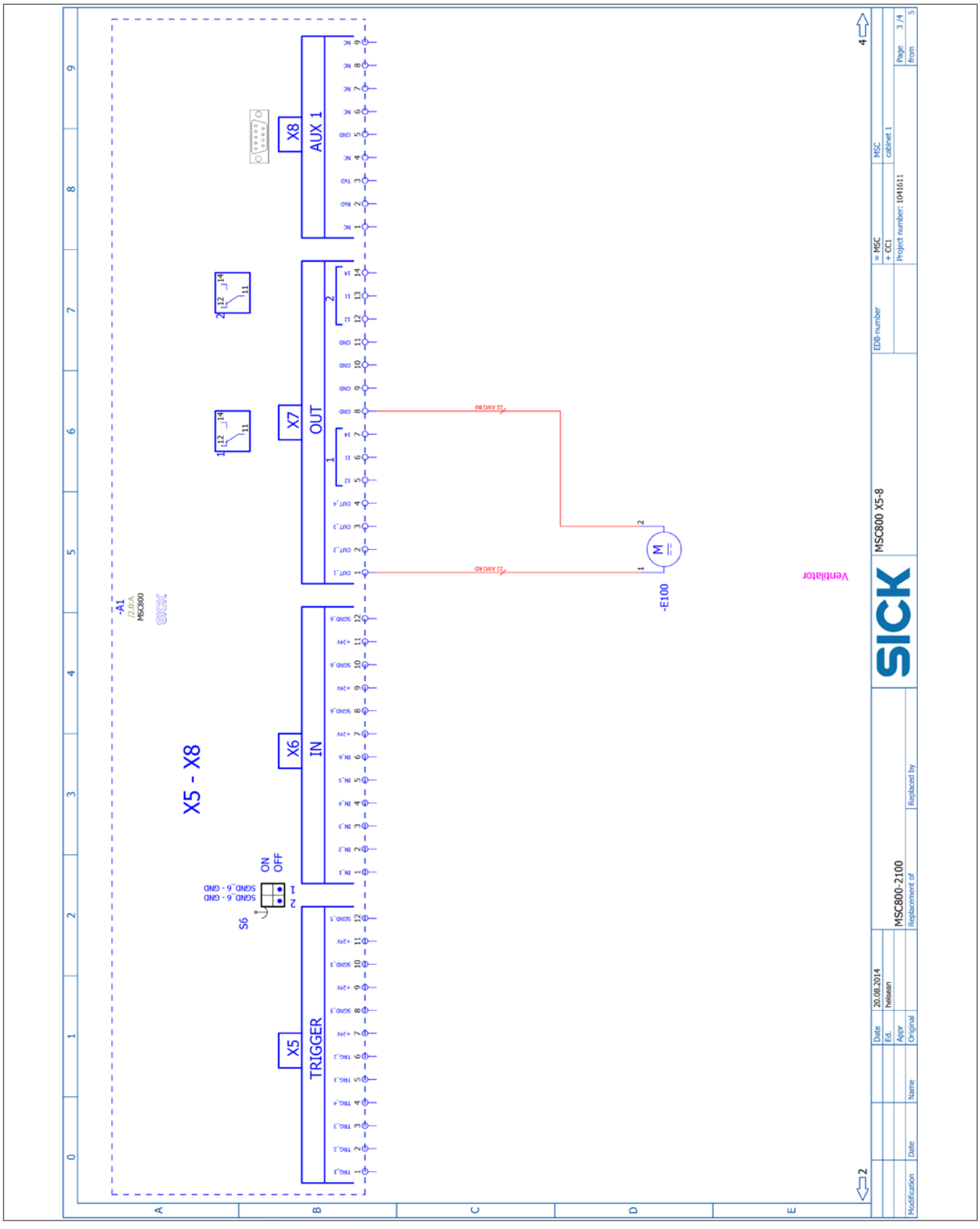


Fig. 49: MSC800-2100 circuit diagram: X5-8

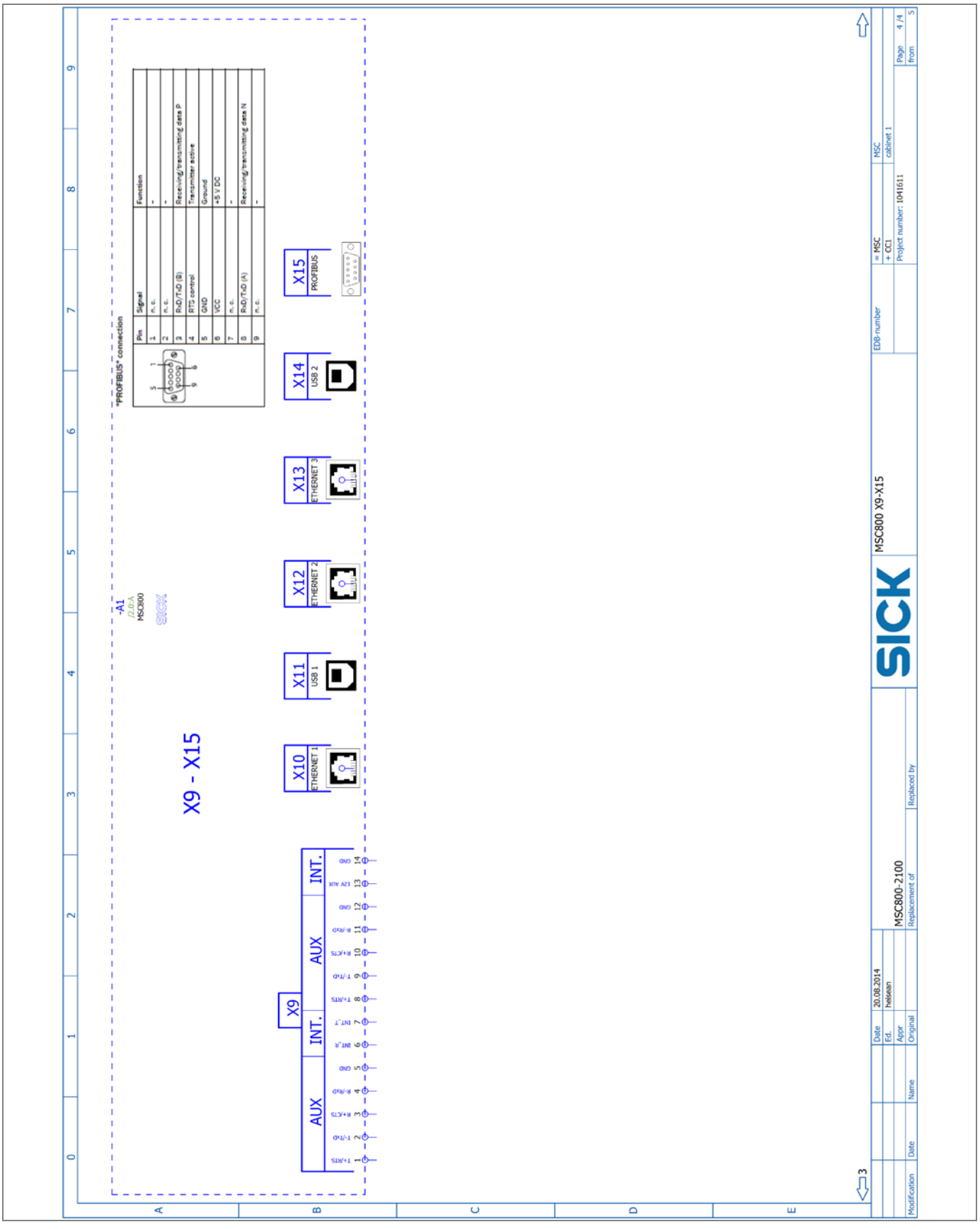


Fig. 50: MSC800-2100 circuit diagram: X9-15

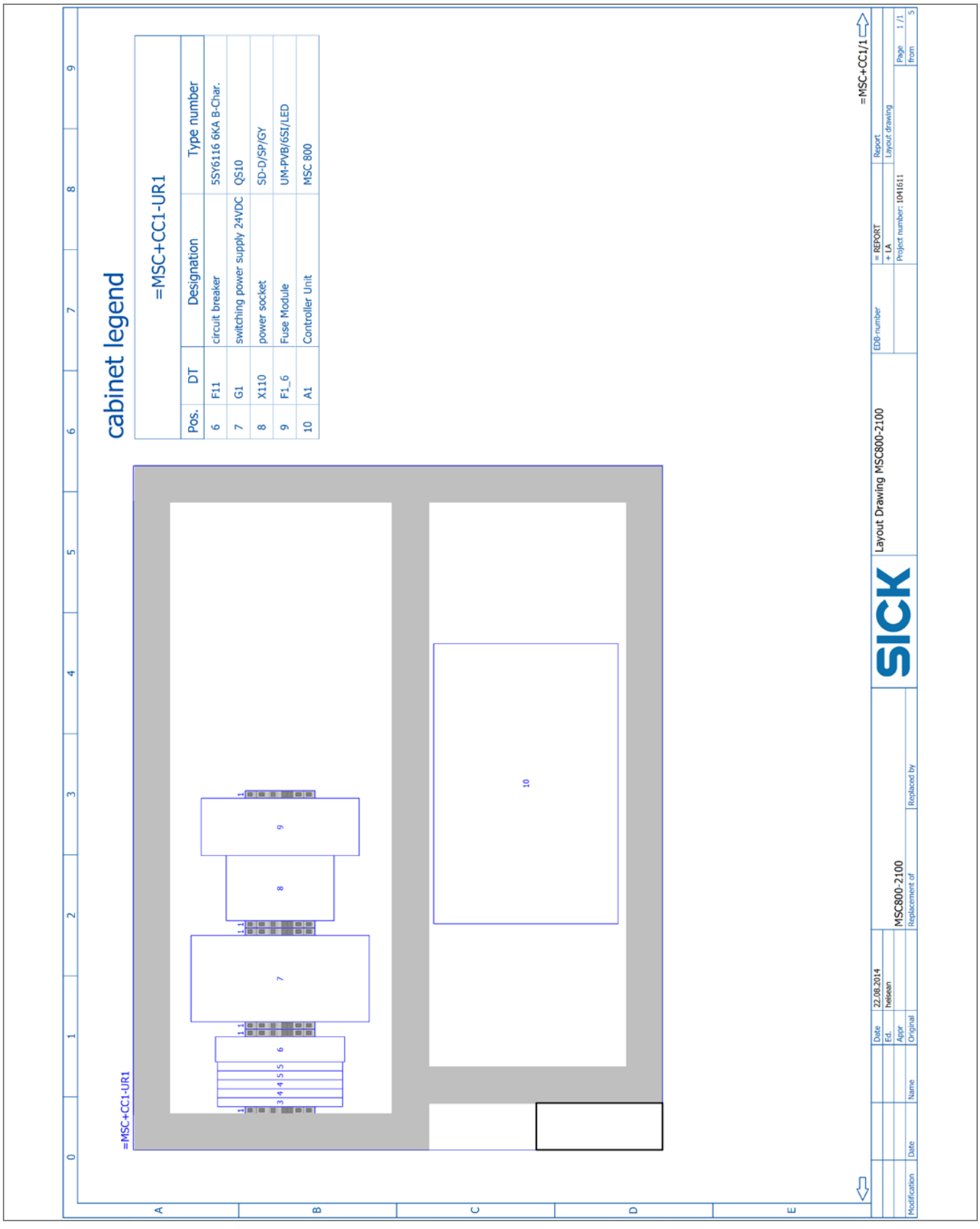


Fig. 51: MSC800-2100 circuit diagram: legend

9.3.3 MSC800-2300 circuit diagram

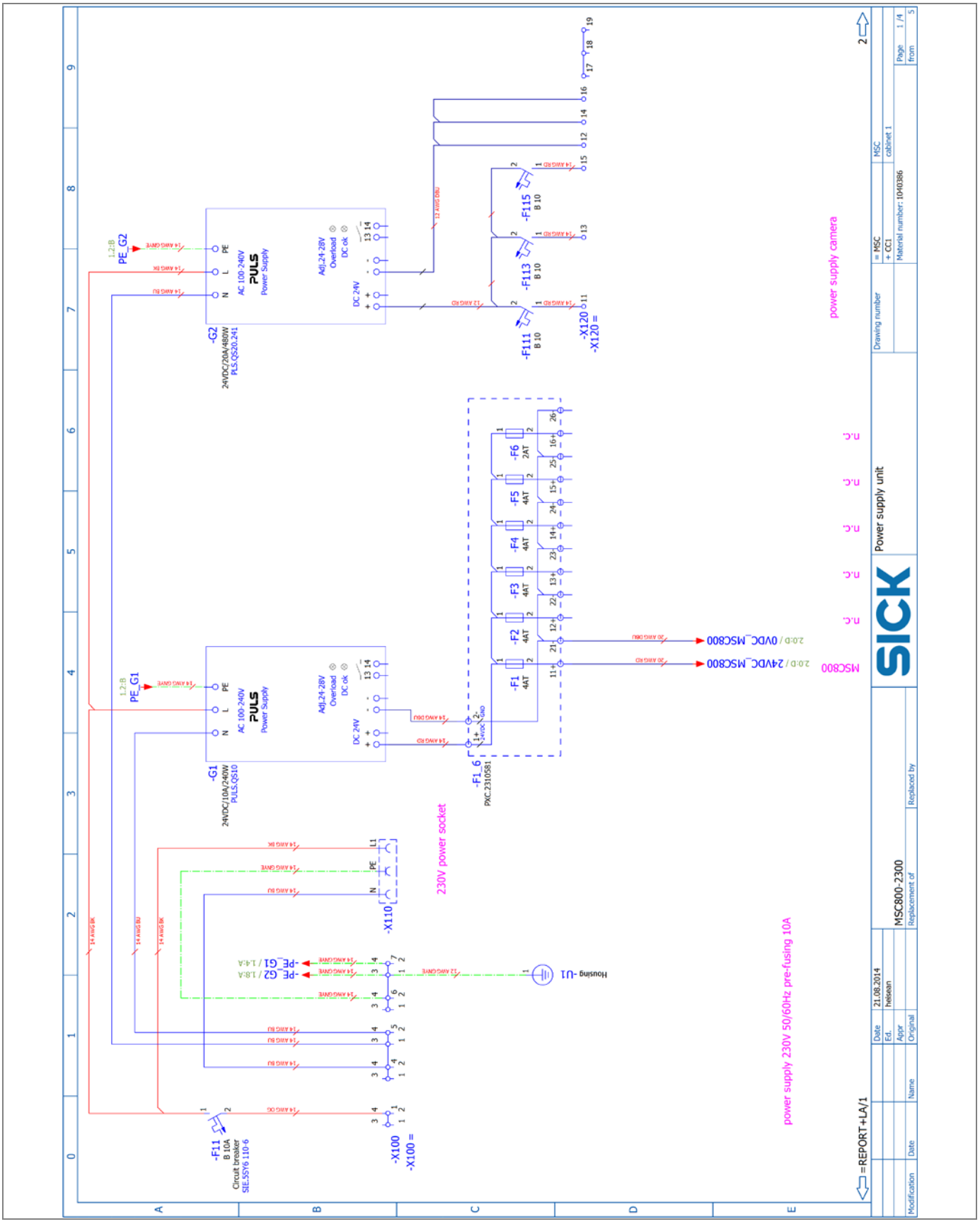


Fig. 52: MSC800-2300 circuit diagram: power supply unit

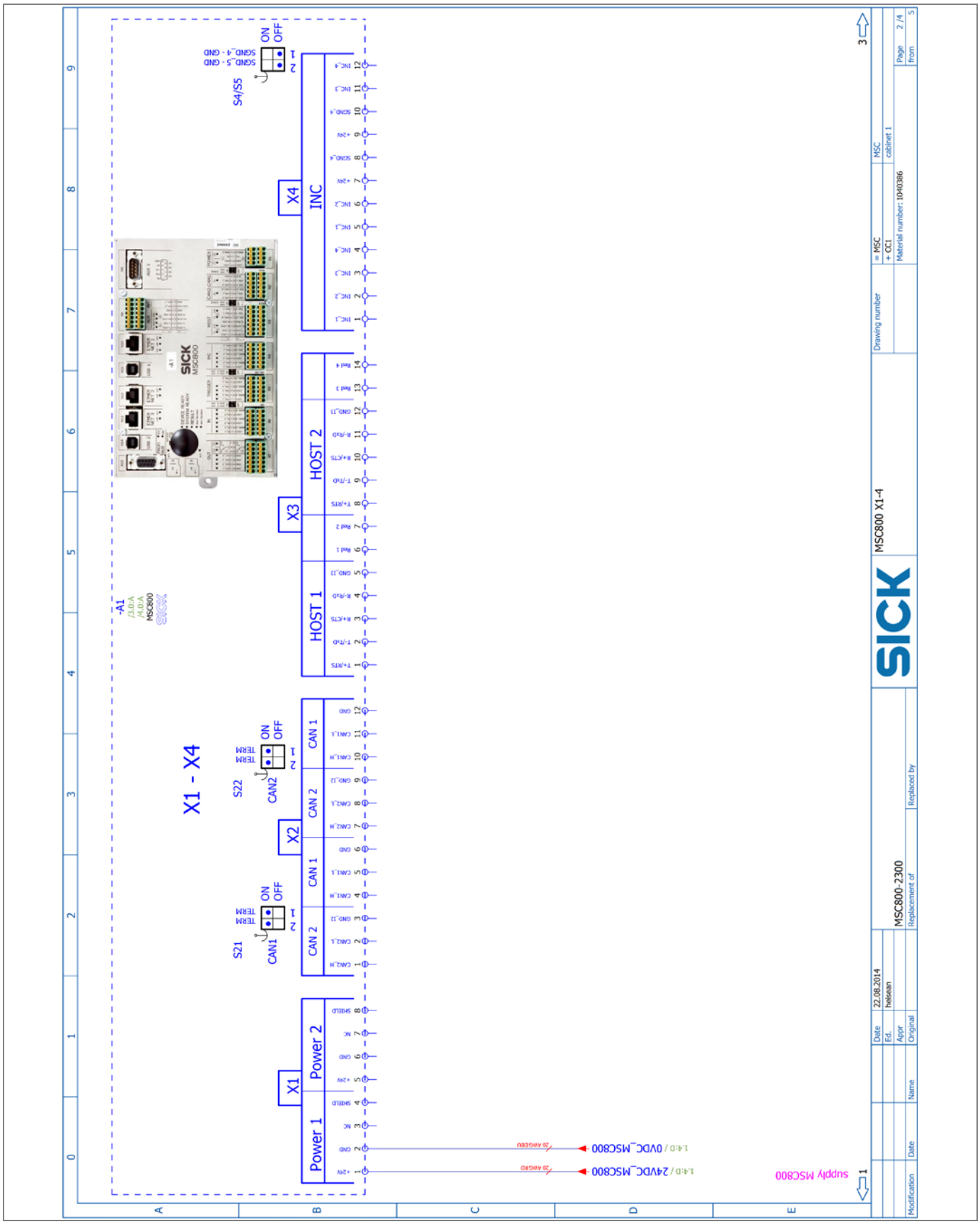


Fig. 53: MSC800-2300 circuit diagram: X1-4

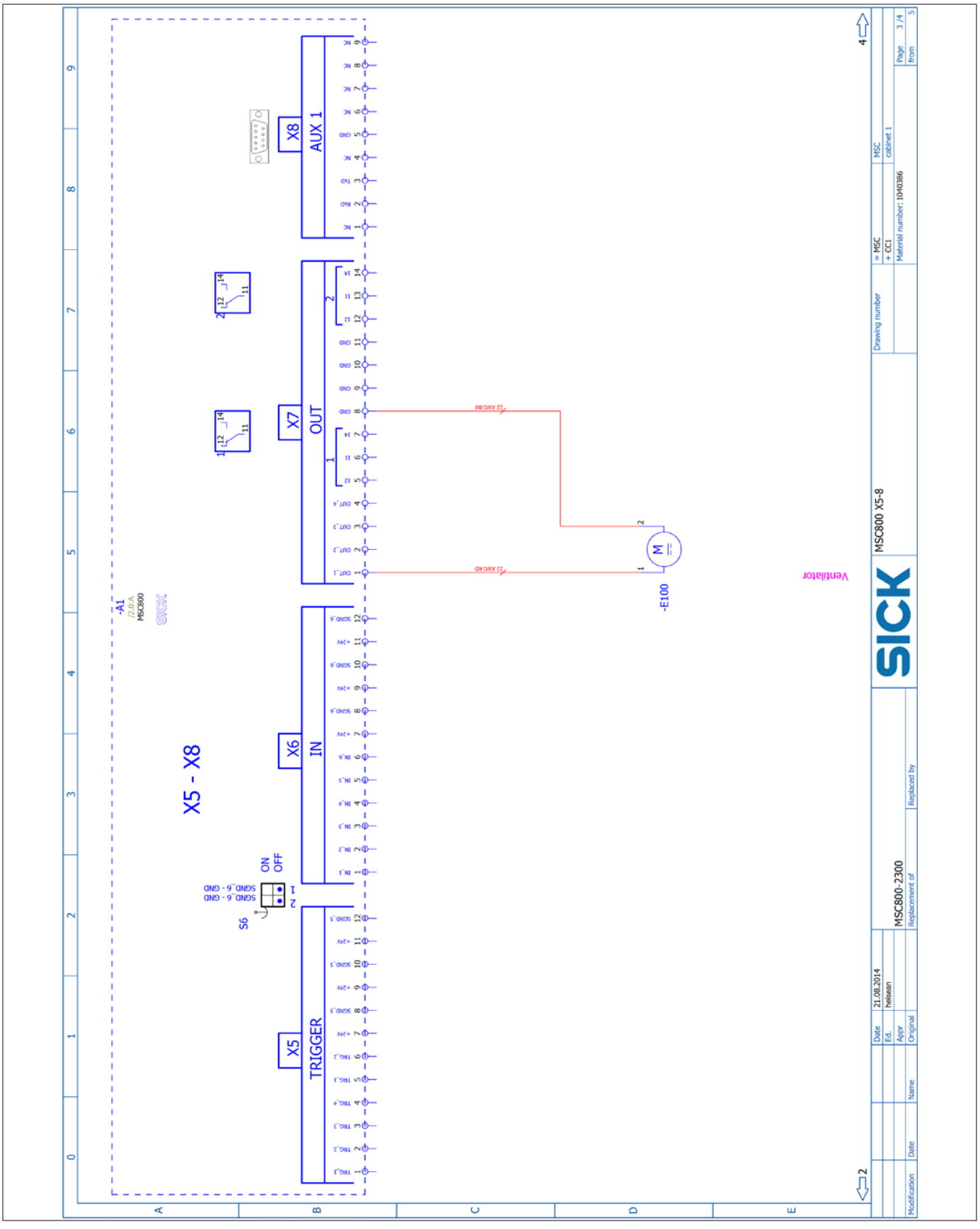


Fig. 54: MSC800-2300 circuit diagram: X5-8

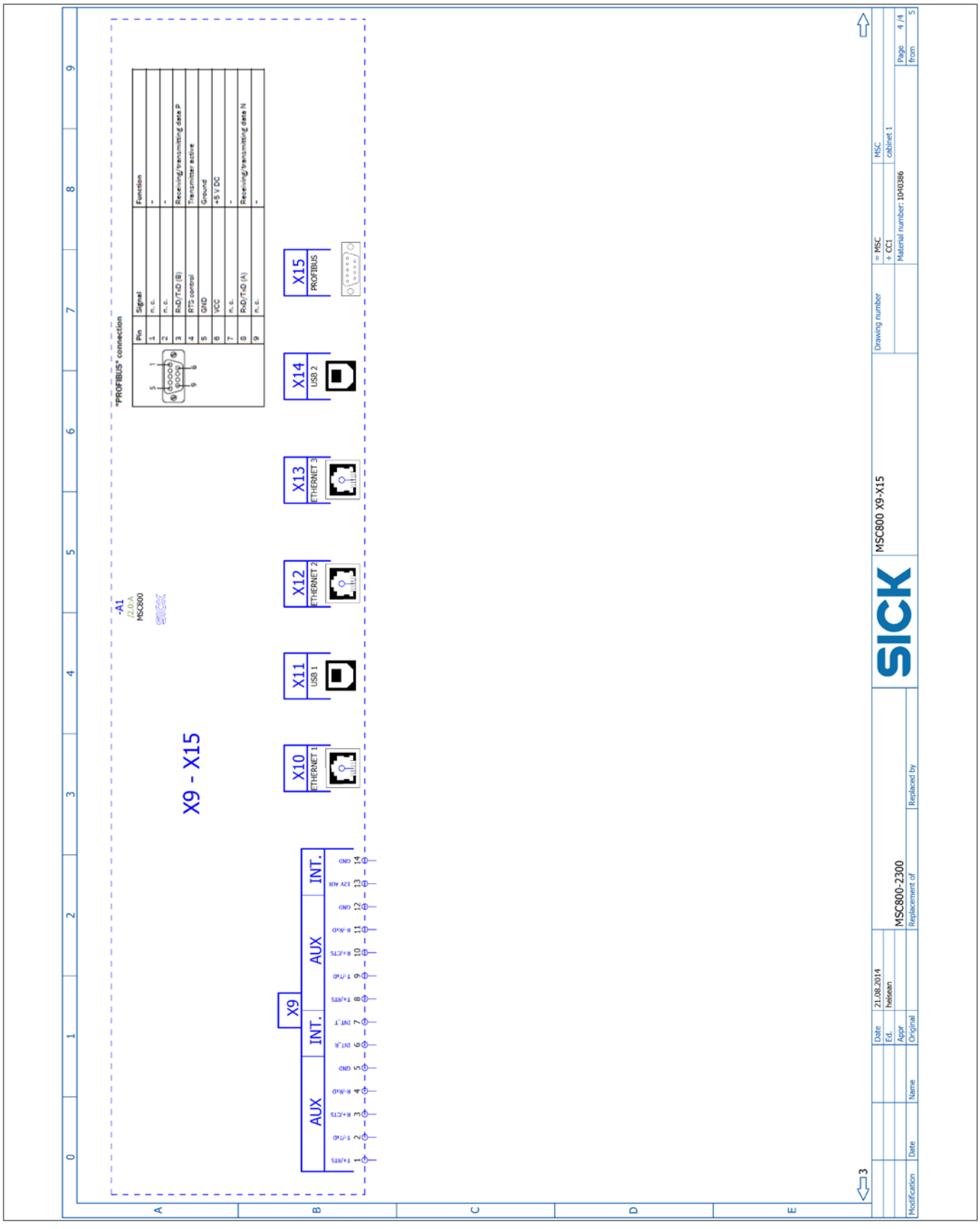


Fig. 55: MSC800-2300 circuit diagram: X9-15

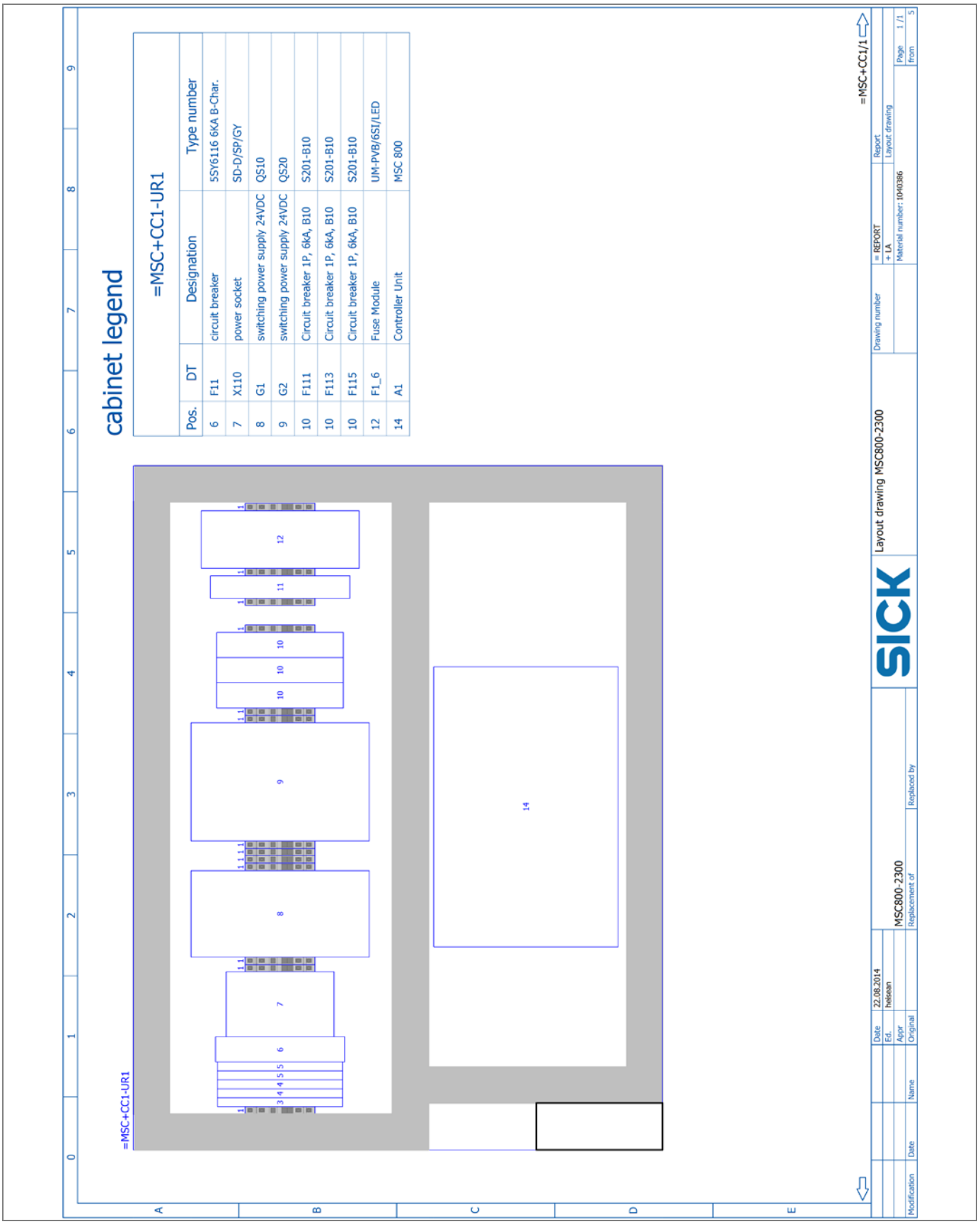


Fig. 56: MSC800-2300 circuit diagram: legend

9.3.4 MSC800-3400 circuit diagram

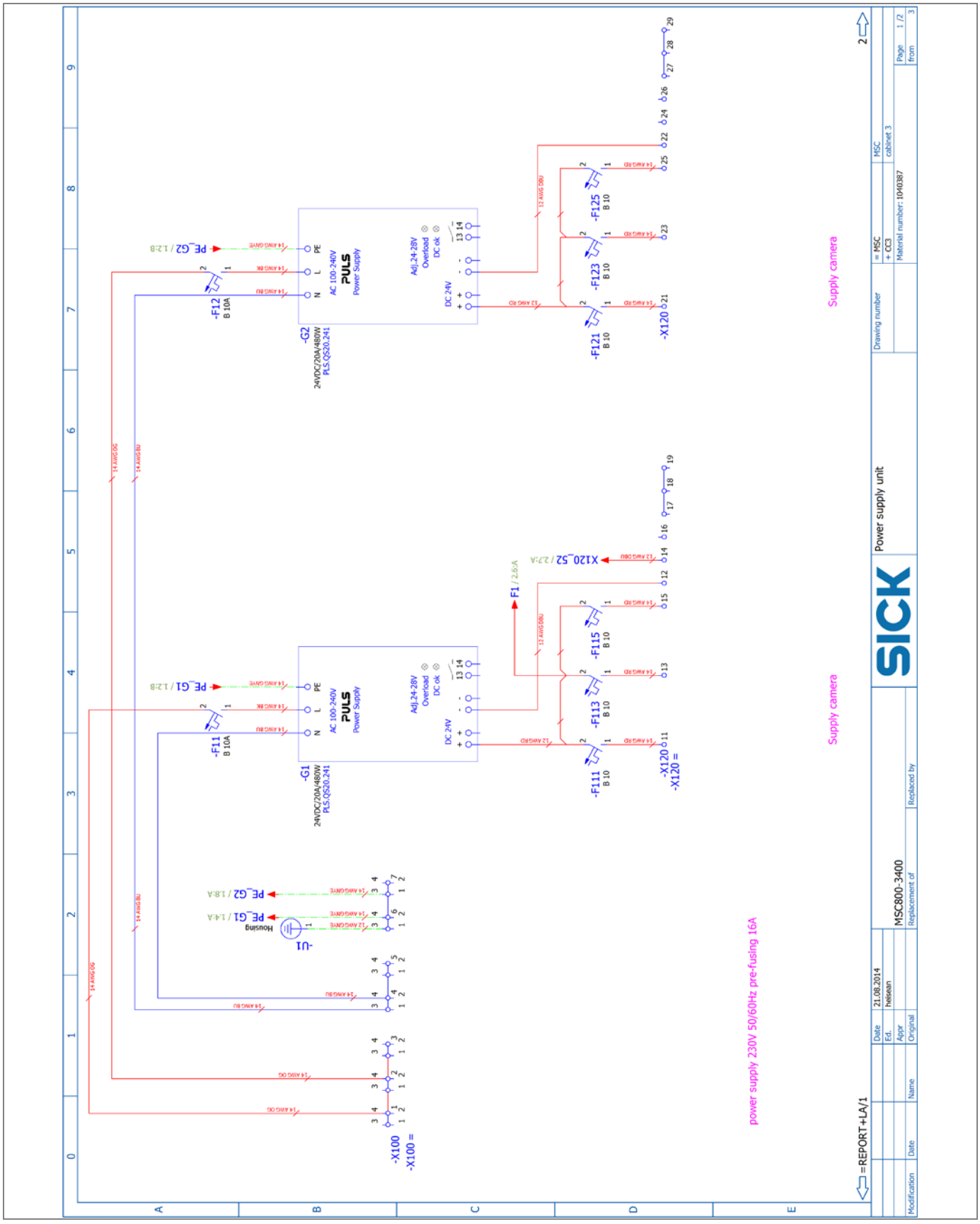


Fig. 57: MSC800-3400 circuit diagram: power supply unit (1)

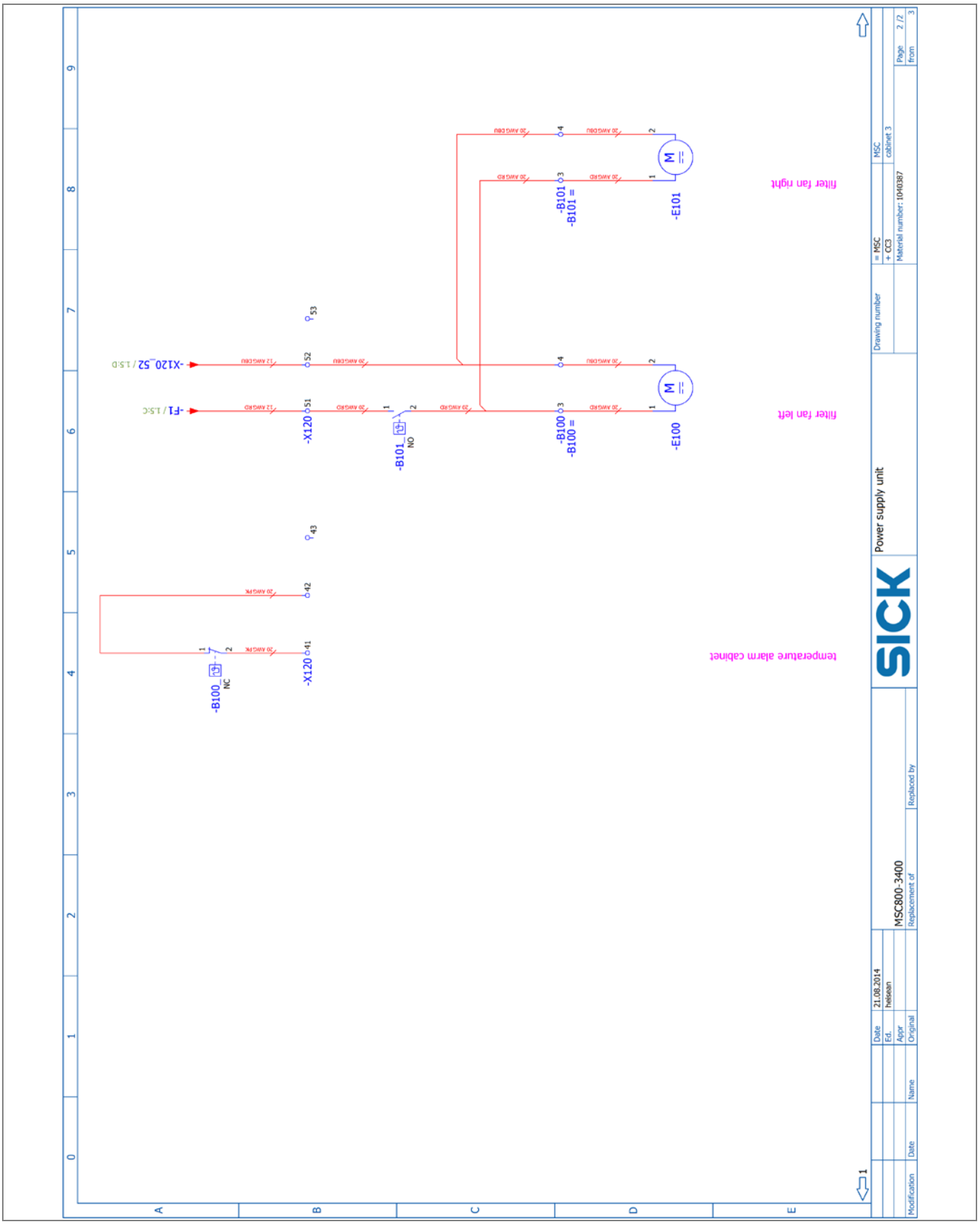


Fig. 58: MSC800-3400 circuit diagram: power supply unit (2)

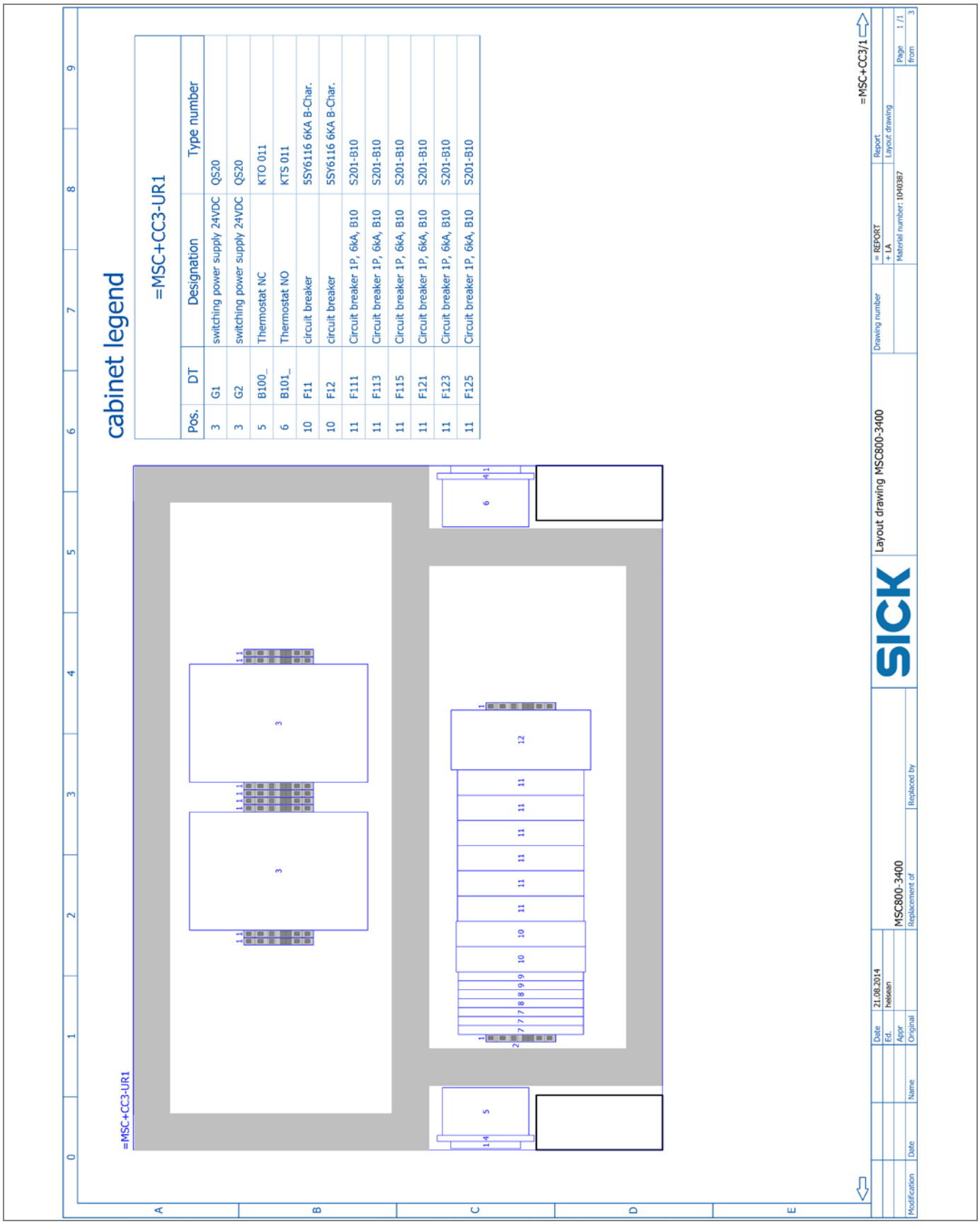


Fig. 59: MSC800-3400 circuit diagram: legend

9.3.5 MSC800-3600 circuit diagram

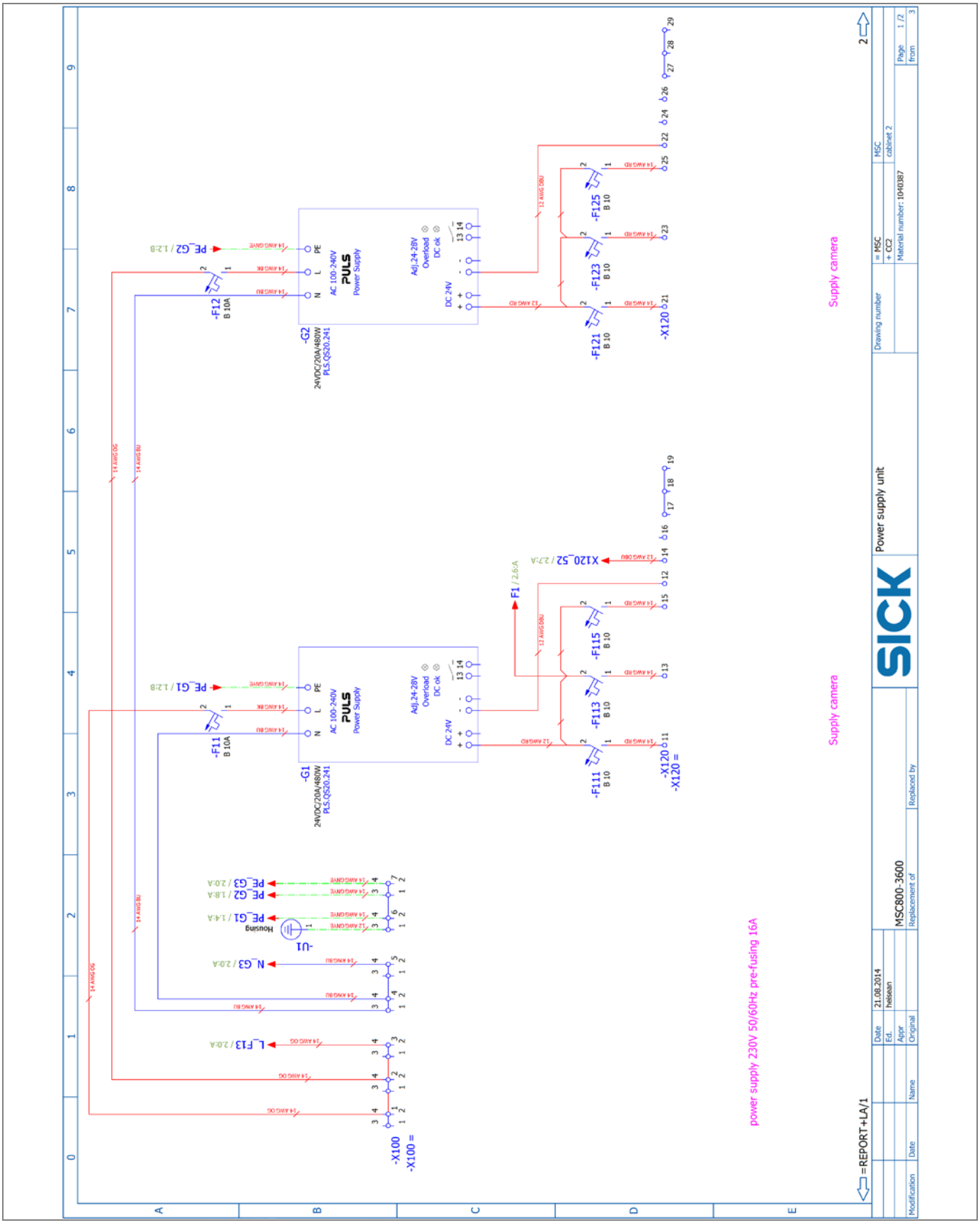


Fig. 60: MSC800-3600 circuit diagram: power supply unit (1)

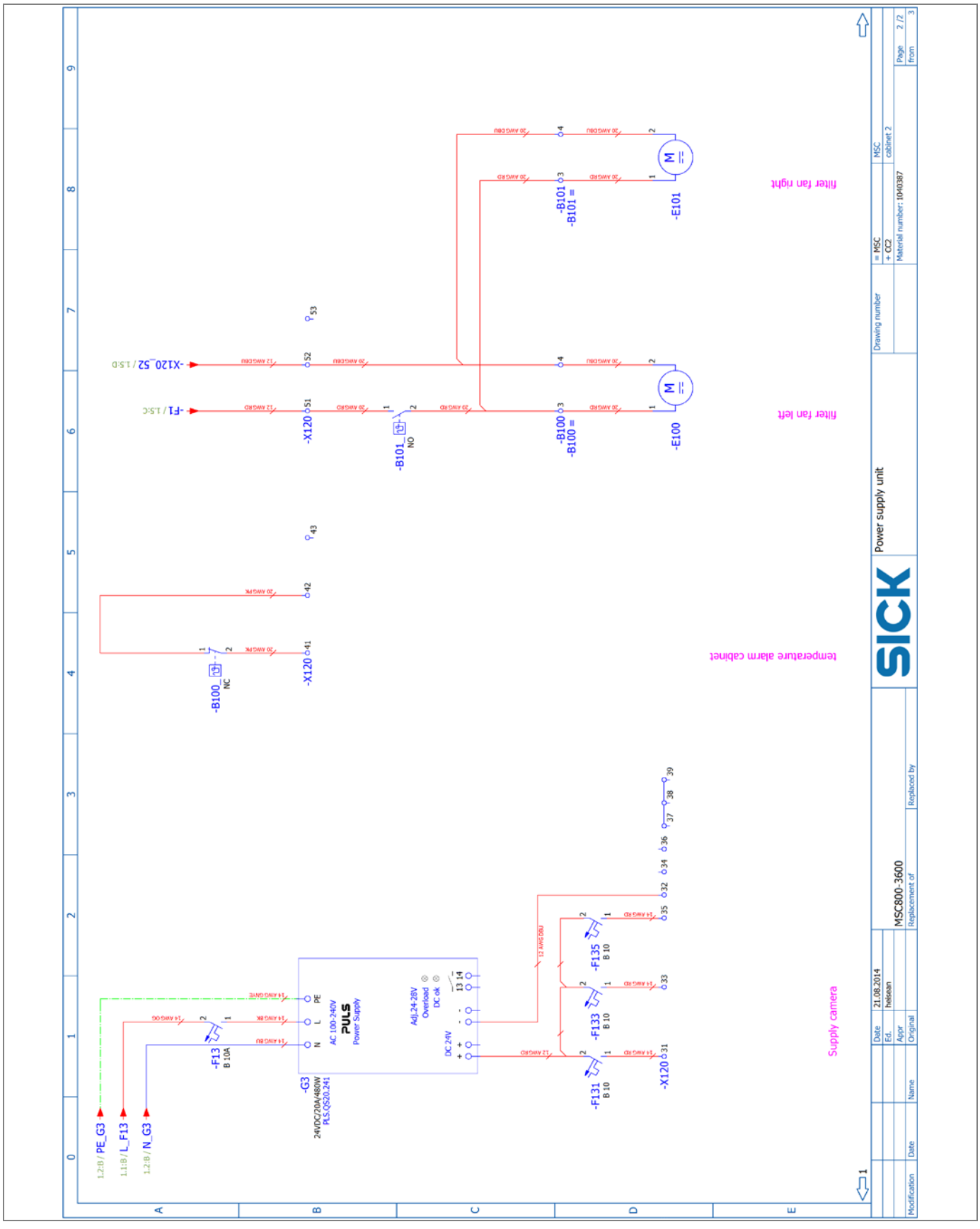


Fig. 61: MSC800-3600 circuit diagram: power supply unit (2)

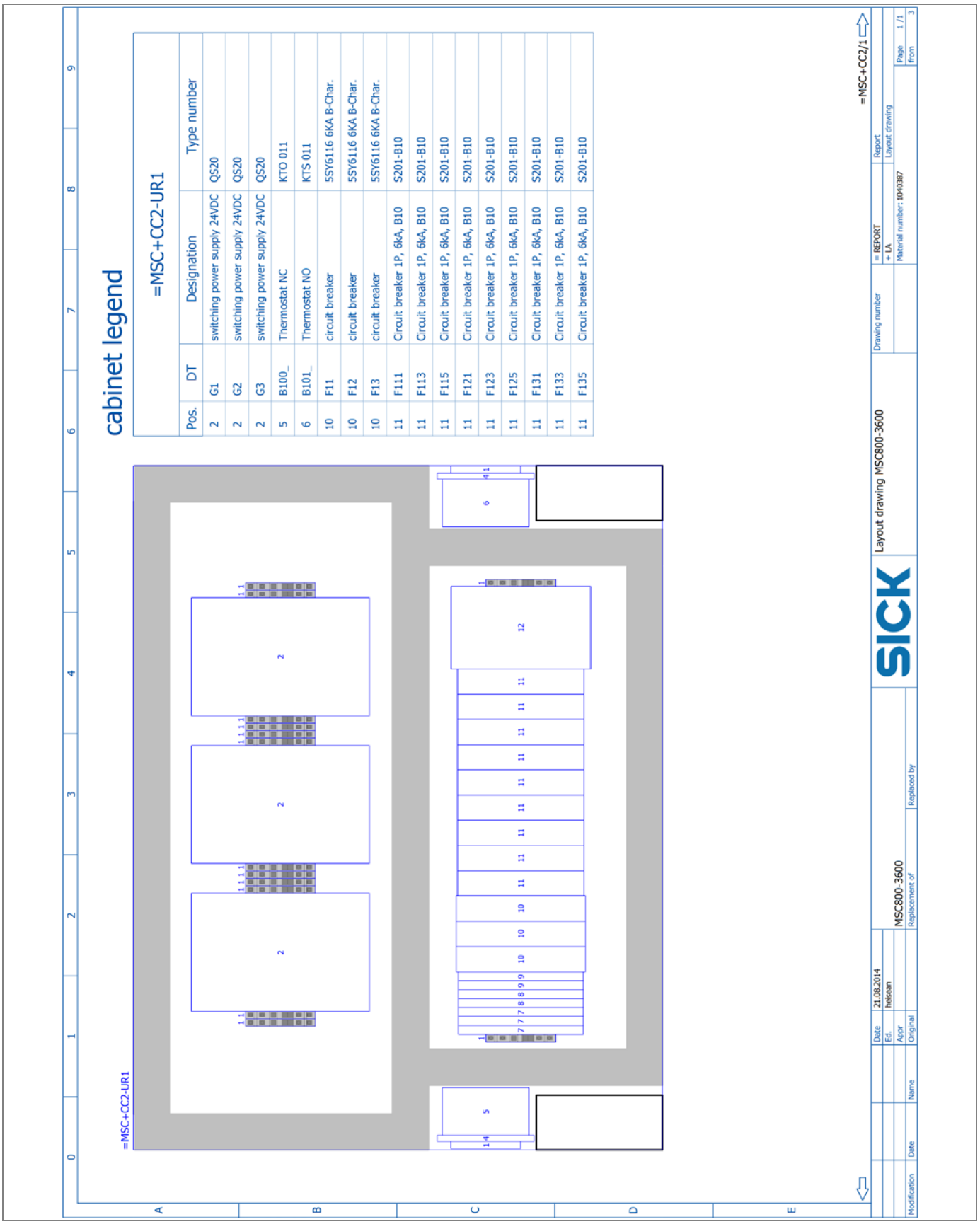


Fig. 62: MSC800-3600 circuit diagram: legend

9.4 Compliance with EU directives

EU declaration of conformity (extract)

The undersigned, who represents the manufacturer below, hereby declares that the product complies with the regulations of the EU directive(s) below (including all relevant changes), and that it is based on the relevant standards and/or technical specifications.

Complete EU declaration of conformity available for downloading

You can access the EU declaration of conformity and the current operating instructions for the protective device by entering the part number in the search field at **www.sick.com** (part number: see the type label entry in the **Ident. no.** field).

10 Annex

10.1 Overview of Annexes

The annex contains the following additions:

- Configuration with command strings
- Ordering information
- Supplementary documentation (overview)
- Glossary
- Figures and tables

10.2 Configuration with command strings

As an alternative to the SOPAS-ET configuration software, the MSC800 can also be configured and operated with command strings via all data interfaces.

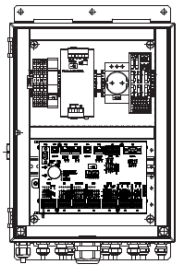
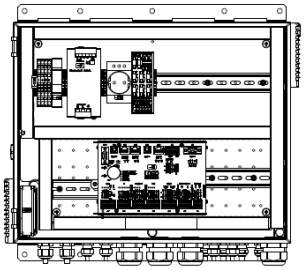
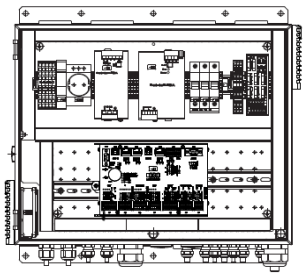
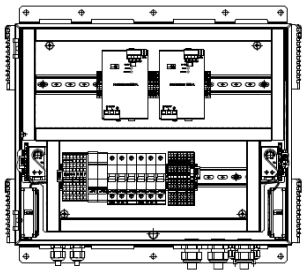
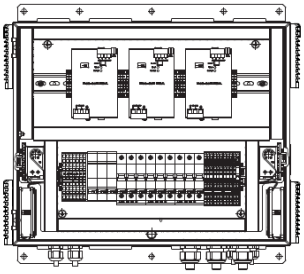
Important

Both the command strings and the SOPAS-ET configuration software are based on a command language that has direct access to the MSC800 command interpreter. This command language must be used with care, as the commands sent to the MSC800 are carried out immediately. Parameter values altered by commands are initially only active in the current parameter set in the working memory (RAM) of the MSC800. For permanent storage, the altered parameter set must be copied with a special command into the Flash-PROM so that the changes are not lost when the supply voltage is switched off.

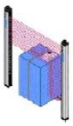
- Command strings upon request.

10.3 Ordering information

10.3.1 MSC800 modular system controller

Part no.	Description	View
1040385	MSC800-1100 (logic unit and power supply unit DC 24 V / 10 A)	
1041611	MSC800-2100 (logic unit and power supply unit DC 24 V / 10 A)	
1040386	MSC800-2300 (logic unit and power supply unit DC 24 V / 30 A)	
1041770	MSC800-3400 (power supply unit DC 24 V / 40 A)	
1040387	MSC800-3600 (power supply unit DC 24 V / 60 A)	

Tab. 53 Ordering information: modular system controller MSC800

Part no.	Description	View
1040571	MSC800-0000 (logic unit)	
2039442	1 x DVD “Manuals & Software Identification & Measuring” with software and documentation	
2034693	1 x read cycle sensor WL18-3 (photoelectric sensor) with connecting cable and mounting set	
2041013	MLG light grid (incl. connecting cable and male connector)	

Tab. 54 Ordering information: modular system controller MSC800 (continued)

Important For precise type designation of the MSC800, see the type label on the device.

10.3.2 Accessories: pre-wired cables for CAN SENSOR Network

Part no.	Description [1]	Wires	Length	Connection
6021166	CAN data cable, Ø 6.8 mm, shielded, twisted pair, with 5-pin M12 female connector and open end (wire ferrules), IP 65, PVC-free	2 x 0.32 mm² 2 x 0.25 mm²	5 m	First ID sensor on MSC800 (open end)
6021175	As no. 6021166, but longer	2 x 0.32 mm² 2 x 0.25 mm²	10 m	First ID sensor on MSC800 (open end)
6021164	CAN data cable, shielded, twisted pair, with 5-pin M12 female connector and 5-pin M12 male connector, IP 65, PVC-free		1 m	ID sensor to ID sensor
6021165	CAN data cable, shielded, twisted pair, with 5-pin M12 female connector and 5-pin M12 male connector, IP 65, PVC-free		3 m	ID sensor to ID sensor
6021168	CAN data cable, shielded, twisted pair, with 5-pin M12 female connector and 5-pin M12 male connector, IP 65, PVC-free		5 m	ID sensor to ID sensor
6021167	CAN termination resistor, shielded, 5-pin M12 male connector, IP 65	–	–	Bus closure on the last ID sensor
1) Other cables on request.				

Tab. 55 Available accessories: pre-wired cables for CAN SENSOR Network

10.3.3 Accessories: male connector covers for CLV490 / VMS4xx/5xx (CAN SENSOR network)

Part no.	Description [1]	Connection
2021164	Male connector cover for CLV490 with parameter memory (EEPROM), with 5-pin M12 female connector and 5-pin M12 male connector, IP 65	CLV490 on CAN SENSOR network
2035330	Male connector cover for CLV490 with parameter memory (EEPROM), with 5-pin M12 female connector and 5-pin M12 male connector as well as integrated termination resistor 120 Ohm, IP 65	Bus closure on the last CLV490
2034152	Male connector cover set 2 for VMS410/510 (1 cover) with parameter memory (EEPROM), with 5-pin M12 female connector and 5-pin M12 male connector, IP 65	VMS410/510 on CAN SENSOR network
2031365	Male connector cover set 6 for VMS420/520 (2 covers) with parameter memory (EEPROM), with 5-pin M12 female connector and 5-pin M12 male connector, IP 65	VMS420/520 on CAN SENSOR network
1) Other male connector covers on request.		

Tab. 56 Available accessories: male connector covers for CLV490 / VMS4xx/5xx (CAN SENSOR network)

10.3.4 Accessories: pre-wired cables for Ethernet connection (MSC800)

Part no.	Description [1]	Length	Connection
6026083	Patch cable, gray, shielded, twisted pair, with RJ-45 male connector (IP 20) and RJ-45 male connector (IP 20), CAT5	3 m	MSC800 via switch/hub to Ethernet
6026084	Crossover cable, red, shielded, twisted pair, with RJ-45 male connector (IP 20) and RJ-45 male connector (IP 20), CAT5	3 m	MSC800 direct to PC/Host
1) Other cables on request.			

Tab. 57 Available accessories: pre-wired cables for Ethernet connection

10.3.5 Accessories: incremental encoder (MSC800)

Part no.	Description
2039455	Incremental encoder with friction gear, resolution 10 mm/clock, max. 100 kHz, supply voltage DC 10 ... 30 V, operating temperature 0 ... +60 °C. With mounting bracket and material, connecting cable 10 m with 5-pin M12 female connector and open end. For operation with the ICR890 system and a MLG light grid
2039457	Incremental encoder with friction gear, resolution 0.2 mm/clock, max. 100 kHz, supply voltage DC 10 ... 30 V, operating temperature 0 ... +60 °C. With mounting bracket and material, connecting cable 10 m with 5-pin M12 female connector and open end. For operation with the ICR890 system and a VMS4xx/5xx
2039456	Incremental encoder with friction gear, resolution 1 mm/clock, max. 100 kHz, supply voltage DC 10 ... 30 V, operating temperature 0 ... +60 °C. With mounting bracket and material, connecting cable 10 m with 5-pin M12 female connector and open end. Use is application-dependent (not for operation with VMS4xx/5xx)

Tab. 58 Available accessories: incremental encoder

10.3.6 Consumables

Filter mat for ventilation of the MSC800-2100/-2300/-3400/-3600

Part no.	Description
5323683	Filter mat, square 89 mm x 89 mm with beveled corners, for air inlet and outlet opening of the ventilation, unit of 5

Tab. 59 Available accessories: filter mat for ventilation of the MSC800-2100/-2300/-3400/-3600

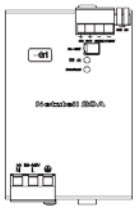
10.3.7 Spare parts

MSC800-1100/-2100/-2300

Part no.	Description	View
6032863	Power supply unit module, input AC 100 ... 264 V, 50 ... 60 Hz, output DC 24 V / 10 A	

Tab. 60 Ordering information: power supply unit module (spare part) for MSC800-1100/-2100/-2300

MSC800-2300/-3400/-3600

Part no.	Description	View
6033968	Power supply unit module, input AC 100 ... 264 V, 50 ... 60 Hz, output DC 24 V / 20 A	

Tab. 61 Ordering information: power supply unit module (spare part) for MSC800-2300/-3400/-3600

10.4 Supplementary Documentation

Part no.	Title[)]	Language	Contents
8011324	Operating instructions “High-End-CCD camera system ICR890”	German	Description of the installation, commissioning, and configuration of the ICR890 system
8011325	Operating instructions “High-End-CCD camera system ICR890”	English	Description of the installation, commissioning, and configuration of the ICR890 system
8009403	Operating instructions “Modular Light Grid MLG”	German/ English	Description of the installation, commissioning, and configuration of the MLG light grid
8010591[1)]	Operating instructions “VMS410 / VMS510 volume measurement system”	German	Description of the installation, commissioning, and configuration of the VMS410 / VMS510
8010592[1)]	Operating instructions “VMS410 / VMS510 volume measurement system”	English	Description of the installation, commissioning, and configuration of the VMS410 / VMS510
8010447[2)]	Operating instructions “VMS420 / VMS520 volume measurement system”	German	Description of the installation, commissioning, and configuration of the VMS420 / VMS520
8010448[2)]	Operating instructions “VMS420 / VMS520 volume measurement system”	English	Description of the installation, commissioning, and configuration of the VMS420 / VMS520
8010817[3)]	Mounting instructions “Male connector cover for volume measurement system VMS4xx/VMS5xx”	German/ English	Description of the installation and connection of male connector covers
8009992[4)]	Operating instructions “CLV490 bar code scanner”	German	Description of the installation, commissioning, and configuration of the CLV490
8009993[4)]	Operating instructions “CLV490 bar code scanner”	English	Description of the installation, commissioning, and configuration of the CLV490

1) On CD-ROM “Manuals & Software VMS410 / VMS510” (no. 2034044), which is enclosed with the VMS410 / VMS510.

2) On CD-ROM “Manuals & Software VMS420 / VMS520” (no. 2038921), which is enclosed with the VMS420 / VMS520.

3) See 1) and 2).

4) On CD-ROM “Manuals & Software Bar Code Scanners” (no. 2029112), which is enclosed with the CLV490.

Tab. 62 Supplementary documentation for the MSC800

10.5 Glossary

For other terms, see also the online help for the SOPAS-ET configuration software.

1D code

Also known as linear code or bar code.

Field of dark bars and light gaps arranged in parallel (both together referred to as elements), which can be depicted according to a specific regulation (specification) on the medium (background) using various marking procedures.

An appropriate number and combination of machine-readable bars and gaps results in an (alpha)numeric character which can be read by the user. As the entire coded information, bordered by start and stop characters, is completely available in one dimension, and is also usually recorded in lines, this bar code is referred to as a linear code. The various 1D code types differ in terms of the stock of characters that can be coded, the structure (number of elements per line, number of characters, start/stop characters, mark of conformity), the information depth, and the print tolerances. The length of the code bars and gaps is not significant for the information content. However, longer code bars and gaps can be detected more easily with the reading device.

2D code

Also known as matrix codes. This group also includes stacked codes.

In the two-dimensional code, the information is arranged in a greater density with the aid of dark and light cells (squares) in a matrix. The vertical and horizontal arrangement of the cells relative to the reference points in the middle and at the edges determines the data content, which is defined by the specification. For error correction during reading, the code is equipped with a redundancy via a mathematical process (e.g., in the case of data matrix ECC200 via error correction code words). The omni-directional reading of 2D codes is carried out using image processing.

Aux interface

Logical auxiliary data interface of the MSC800 in dual design (AUX 1/2). Can be physically switched in each case to serial RS-232, RS-422/485 and Ethernet (default: port 2111 / port 2113).

The serial data interfaces are used for diagnostics (output of read diagnostic data or monitoring of the data traffic of the host interfaces in the fixed data format), and also offer special protocols or customer-specific data output formats, as well as the general adjustable data format and transmission rate. The data output of the serial data interfaces can be deactivated in each case.

The two Ethernet Aux ports are used for the output of read diagnostic data in the fixed data output format, and the Aux2 port also offers special protocols or customer-specific data output formats. The data output of the Aux2 port can be deactivated, but the data output of the Aux1 cannot be. It is always possible to gain access to the MSC800 for operation and configuration via the auxiliary data interface using the PC and the SOPAS-ET configuration software.

Auxiliary input

Special function of the ⇨ Aux interface of the MSC800. Used for subsequent manual entry of code data in order to complete read results sent to the host.

CAN interface

Physical data interface. Used for building a fast SICK-specific CAN SENSOR network with different functions (e.g., multiplexer, master/slave) or integration into existing CAN networks according to the CANopen® protocol. Access to the MSC800 is possible for configuration and operation via the CAN interface (network) with the aid of the SOPAS-ET configuration software in remote mode.

Capture range

Zone which an ID sensor/the MSC800 sets up with the aid of increment management and comparing the reading angle around a moving code. Allows, among other things, for the separation of codes with identical content with the same code type.

Command strings, commands

Human machine interface to the MSC800 as an alternative to the SOPAS-ET configuration software.

The command strings form a clearly structured command language for the online modification of the parameter value set in the MSC800. They directly access the command interpreter of the MSC800. Used by the host for programming work as needed.

The SOPAS-ET configuration software is based on the command strings.

Configuration file

Project file of the SOPAS-ET configuration software, in which either only one complete parameter value set of a device is saved or, if several devices are combined for a project, a complete parameter set is saved for each device for archiving on the PC.

The project file can be printed out in table form, transferred to the clipboard, and provided as a PDF.

Data output string

Structured data telegram of the ⇨ read result in two independent data output formats, which prepares the MSC800 from its database for issuing.

The output formats can each be issued via ⇨ host interfaces (HOST 1/2), optionally to the physical data interfaces RS-232 / RS-422/485, Ethernet, or CAN. The structure of the output formats is flexible (sequence of the code segments and elements, linking with event conditions, filter, sorter, etc.) and can be adjusted, within wide limits, to the application-specific requirements. The data output format of the ⇨ Aux interfaces (AUX 1/2) for the reading result (diagnosis), on the other hand, cannot be changed.

Decoder, decoding

Assessment routine, dependent on the code type, for the reconstruction of the read code in electronic form, in order to decrypt the data content from the code.

Download

Process of transmitting parameter values, using the SOPAS-ET configuration software, from the PC to the connected MSC800.

In the “Online” communication mode, in the case of the “Immediate download” option (default), SOPAS-ET always automatically temporarily transfers parameter values that have just been modified to the working memory (RAM) of the MSC800 in the background. With this option, the current parameter values in the MSC800 are constantly synchronized with the modifications made in the user interface.

With the “Download on demand” option, however, the adjustment is carried out manually and is the user's responsibility. If non-synchronized statuses occur for individual parameter values between SOPAS-ET and the connected MSC800, then SOPAS-ET marks these parameters with a blue border.

By right-clicking in the context menu, the modified parameter value of a tab (transfer parameters to the device) can be manually transferred to the MSC800 when needed.

Via the communication menu, it is possible to transfer either only modified parameter values (download amended parameter to the device) or all parameter values of the MSC800 (download all parameters to the device).

Only when the “permanent” save option (“MSC800” menu) is used will the parameter values that have previously only been temporarily changed in the MSC800 be saved permanently. The transferable parameter values depend on the current user level in SOPAS-ET.

Error messages

Messages in coded form, with which the MSC800 displays a diagnosed error. The MSC800 differentiates between four error types: information, warning, error, severe error. The error messages can be displayed in the SOPAS-ET configuration software in the SYSTEM INFORMATION tab.

Ethernet interface

Physical data interface with transmission rate 10/100 MBit/s, TCP/IP, and FTP protocol. The Ethernet interface can be used for the ⇨ host interfaces (Host 1/2) and the ⇨ Aux interfaces (AUX 1/2), in each case parallel to the physical RS-232, RS-422/485 interfaces. The MSC800 can be configured via all four Ethernet ports.

Event display

Adjustable function of each of the four digital switching outputs “OUT 1” to “OUT 4” and of the two relay outputs of the MSC800. Signals either the status of the read result (e.g., Good Read) or the fulfillment of an event-dependent assessment condition which can be defined for the read process (e.g., Match1). In addition, system statuses of the MSC800 can also be signaled (e.g., fan on). The outputs are independent of each other and can also each be deactivated.

The logic level can also be selected.

Functional interfaces

Digital switching inputs and outputs as well as relay outputs of the MSC800.

Good read

The defined assessment condition(s) was (were) successfully met in the reading event during the last read clock.

Header

Data block in the read result of the ⇨ host interface of the MSC800.

Used in the ⇨ data output string as a header for the subsequent data contents of the code. Consists of read diagnostics data and/or constants (control characters, letters, numbers).

Host interface

Logical main data interface of the MSC800 in dual design (HOST 1/2) with two independent data output formats, which can be configured. Among other things, this is used for outputting the read result in the form of a telegram to the host/PLC.

Can be physically switched in each case on serial RS-232, RS-422/485 and Ethernet (default: port 2112 / port 2114) or CAN. Works together with the SICK-specific CAN SENSOR network as a gateway. Provides different transfer protocols (apart from for CAN) or customer-specific data output formats. The data format and the transmission rate of the serial data interfaces can each be set, the data output can be deactivated.

In this case, an existing parallel data output via Ethernet still remains active. However, it can also be deactivated.

Access to the MSC800 is also possible for configuration and diagnosis via the host interfaces with the aid of the SOPAS-ET configuration software.

Master/slave configuration
Special arrangement and switching connection of ID sensors to a read station (e.g., multi-side reading) with the aid of the ⇨ CAN interface. Using MSC800 as the master, the connection to the host functions like a single device.

Multiple reading
Optional number of readings which must provide identical internal reading results for one and the same code before an ID sensor issues the reading result.

No read
The defined assessment condition(s) was (were) not met in the reading result during the last read clock.

No read format
Special configurable output format for no reads in the data output string as a replacement for the output formats for reading where the assessment conditions are met.

In the default, the MSC800 issues the “NoRead” string, bordered by STX and EXT, as the no read format.

Object distance, object height
Dimension for focusing the ID sensors. Is determined during reading from above, e.g., by using an MLG light grid, or during reading from the side, e.g., using a VMS4xx/5xx volume measurement system on the conveying line.

Parameter set
Data set which is used to initialize and activate the implemented functions in the MSC800.

This is transmitted from the MSC800 to the SOPAS-ET configuration software or vice versa using ⇨ upload (all parameter values) or ⇨ download.

Read cycle
Clock present on the MSC800. Used for triggering the internal reading interval.

Carried out from outside on an object-specific basis via an external trigger source such as, e.g., a photoelectric retro-reflective sensor on a switching input or a command string via a data interface.

In the event of an internal “Auto clock” trigger source, the MSC800 generates the read cycle itself. The read cycle is specified to the connected ID sensors by the MSC800 via the CAN bus.

Read diagnostics data
Data related to a code, object, or device, which the MSC800 deduces directly from the read event. The data allows for assessment of the quality of the reading and for conclusions to be made about the read event.

Read result
Electronic representation and output of the data contents of the read codes together with read diagnosis data in a data output string at the defined output time.

Saving in the MSC800
The application-specific ⇨ parameter set can be saved temporarily or permanently in the MSC800.

In the case of temporary saving, the parameter set is only contained in the volatile working memory (RAM) and is lost when the supply voltage is switched off.

In the case of permanent saving, the parameter set is also transferred to the non-volatile memory of the MSC800 and is retained as the current data set after switching off.

The default is saved independently of this in a read-only memory (ROM).

Send time Output time of the reading result in relation to the start of the read cycle and the assessment conditions that are met.

SMART decoder Specially developed ⇨ decoder for reading 1D codes with an extremely small code height (aspect ratio > 1:3) as well as a poor or contaminated print image.

SOPAS ET PC configuration software, can be run under Windows 2000™, XP™, Vista™, Windows 7™, and Windows 8™.

Is used for online communication with the MSC800 in the dialog box (configuration, display of reading results, diagnosis) and the prepared offline configuration of stand-alone devices or the combination of the same or different SOPAS-ET-enabled SICK devices in one project. Via ⇨ upload and ⇨ download, the
⇨ parameter values are exchanged with the MSC800 / the devices in a device-specific manner.

SOPAS-ET help Online help which supports the use of the SOPAS-ET configuration software. The functions of the MSC800 parameters are explained in the help. Runs in an HTML browser, e.g., InternetExplorerTM, and can be called up from the SOPAS-ET configuration software.

Start/stop operation In this operating mode (separate read cycle), there is only one object in the reading field per read cycle. The start and end of the read cycle of the master/slave combination of ID sensors (e.g., two side reading) and MSC800 are controlled by external sensors or corresponding command strings.

When using just one ID sensor (stand-alone device, one side reading) together with the MSC800, the free running of the ID sensor can control the reading. The sensor(s) receive(s) the clocks via the MSC800.

In this case, the reading field length is determined by the distance of the two external sensors for starting (start of reading field) and stopping (end of reading field) the read cycle. The minimum reading distance between two objects must always be larger than the reading field length.

The networking between the ID sensors and the MSC800 is carried out via the CAN interface (CAN SENSOR network). The output of the reading result from the master is carried out via the RS-232 / RS-422/485 interfaces and/or the Ethernet interface.

Terminator Data block in the read result of the ⇨ host interface of the MSC800. Used as the end of the previous data contents of the code. Consists of read diagnostics data and/or constants (control characters, letters, numbers).

Tracking operation In this operating mode (continuous read cycle), there are several objects in the reading field at the same time, one behind the other. For clear assignment of the read codes to the objects, a minimum gap must be maintained between two objects and band increment signals must be available. The reading field length is determined by the distance of the external sensor for the object start/end at the start of the reading field and the object release point (data output) in the conveying direction of the MSC800 at the end of the reading field.

The networking between the ID sensors and the MSC800 is carried out via the CAN interface (CAN SENSOR network). The ID sensors manage reported objects in an internal object tracking list.

Upload

Process for the transmission of all parameter values from the working memory of the connected MSC800 to the PC in the SOPAS-ET configuration software for display and modification.

Is carried out when connecting the device and successfully establishing communication after the scan process following a confirmed query in order to achieve synchronization between the user interface and the MSC800. If necessary, can be triggered manually in the COMMUNICATION menu (UPLOAD ALL PARAMETERS FROM THE DEVICE). The parameter values must be displayed in the tabs in order to be able to modify the current parameter value set.

User interface

Windows-oriented input interface in the SOPAS-ET configuration software for operation and configuration of the MSC800.

10.6 Figures and tables

10.6.1 List of Tables

10.6.2 List of Figures

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